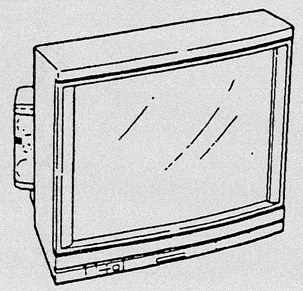
PIONEER
The future of sound and vision.

Service Manual



ORDER NO.
ARP1857

Hi-Fi MONITOR RECEIVER

SD-T292
SD-291

SD-T292 AND SD-291 HAVE FOLLOWING VERSIONS :

Type	Applicable model		Power requirement	Export destination
	SD-T292	SD-291		
RD/G	○	—	AC110V - 127V, 220V, 240V (switchable)	
R/G	—	○	AC110V - 120V, 220V, 240V (switchable)	U.S. Military
RD/Q	○	—	AC110V - 127V, 220V, 240V (switchable)	
RD/Q1	○	—	AC110V - 127V, 220V, 240V (switchable)	

- This service manual is applicable to the SD-T292/RD/G, RD/Q, RD/Q1 and SD-291/R/G types.
- For the SD-T292/RD/Q, RD/Q1 and SD-291/R/G types, please refer to pages 112.
- SD-291/R/G type is a model except for the other circuit of NTSC, M mode and for the circuit of system selection.
- How to system selection of SD-T292 is basically same as the SD-T29/RD/G type, refer to the service guide (ARP1622).
- This service manual is combined with operating instructions (from pages 141).
- Ce manuel pour le service comprend les explications en français de réglage.
- Este manual de servicio trata del método ajuste escrito en español.

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1. SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety related notes located on or inside the cabinet and on the chassis or picture tube.

The following precautions should be observed:

1. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away while picture tubes are handled. Keep picture tube away from the body while handling.
2. When service is required, even though the SD-T292 and SD-291 an isolation transformer should be inserted between power line and the monitor in safety before any service is performed.
3. When replacing a chassis in the monitor, all the protective devices must be put back in place, such as barriers, non-metallic knobs, adjustment and compartment covershields, isolation resistor-capacitor, etc.
4. When service is required, observe the original lead dress. Extra precaution should be taken to assure correct lead dress in the high voltage circuitry area.
5. Always use the manufacturer's replacement components. Especially critical components as indicated on the circuit diagram should not be replaced by other manufacure's. Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Before returning a serviced monitor to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the monitor by the manufacturer has become defective, or inadvertently defeated during servicing.

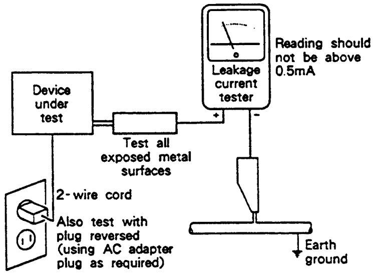
Therefore, the following checks should be performed for the continued protection of the customer and service technician.

Leakage Current Cold Check

With the AC plug removed from the 110-127V/220-240V AC 50/60Hz source, place a jumper across the two plug prongs. Turn the AC power switch on. Using an insulation tester (DC 500V), connect one lead to the jumpered AC plug and touch the other lead to each exposed metal part (input/output terminals, screwheads, metal overlays, control shafts, etc.), particulary any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistor reading of 0.3MΩ and a maximum resistor reading of 5MΩ. Any resistor value below or above this range indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicated and open circuit.

Leakage Current Hot Check

Plug the AC line cord directly into a 110-127V/220-240V AC 50/60Hz outlet (do not use an isolation trasformer for this check). Turn the AC power switch on. Using a "Leakage Current Tester (Simpson Model 229 equivalent)", measure for current from all exposed metal parts of the cabinet (input/output terminals, screwheads, metal overlays, control shaft, etc.), particularly any exposed metal part having a return path to the chassis, to a known earth ground (water pipe, conduit, etc.). Any current measured must not exceed 0.5mA.


Device under test
Leakage current tester
Reading should not be above 0.5mA
+
-
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE MONITOR TO THE CUSTOMER.

High Voltage

This display is provided with a hold down circuit for clearly indicating that voltage has increased in excess of a predetermined value. Comply with all notes described in this Service Manual regarding this hold down circuit when servicing, so that this hold down circuit may correctly be operated.

Serviceman Warning

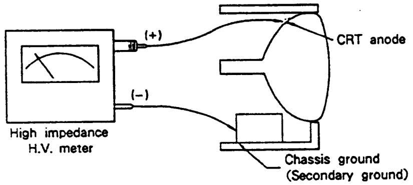
With Minimum Brightness and Picture, operating high voltage in this monitor is lower than 28.6kV (at the NTSC mode of SD-T292, and SD-291), 28.9kV (*1) (at the PAL or SECAM modes of SD-T292). In case any component having influence on high voltage is replaced, confirm that high voltage with minimum Brightness and Picture is lower than 28.6kV (at the NTSC mode of SD-T292, and SD-291), 28.9kV (*1) (at the PAL or SECAM modes of SD-T292).

To measure H.V. use a high impedance H. V. meter. Connect (-) to chassis earth and (+) to the CRT anode button. (See the following connection diagram).

NOTE:

Turn power switch off without fail before the connection with Anode button is made.

*1: The voltage at the PAL or SECAM modes of SD-T292 are reference value.



X-radiation

TUBE: The primary source of X-radiation in this display is the picture tube. The tube utilized for the above mentioned function in this chassis is specially constructed to limit X-radiation emissions.

For continued X-radiation protection, the replacement tube must be the same type as the original, PIONEER approved type.

When trouble shooting and making test measurements in a monitor with a problem of excessive high voltage, avoid being unnecessarily close to the picture tube and the high voltage components.

Do not operate the chassis longer than is necessary to locate the cause excessive voltage.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in PIONEER display have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, X-radiation, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

3. CHARGED SECTION AND HIGH VOLTAGE GENERATING POINT

Charged section

The circuit in which the commercial AC power is used as it is without passing through the power supply transformer. If the charged section is touched, there is danger of receiving electric shock. In addition, there is the danger of damaging the measuring equipment if it is connected to the GND of the charged section and the GND of the non-charged section while connecting the set directly to the commercial AC power supply. In this case, be sure to connect the set via an insulated transformer and flow the current.

- CHARGED SECTION OF POWER SUPPLY & DEFLECTION assembly
- POWER SWITCH assembly
- Degausser coil (L1)
- Voltage selector (S1)
- AC power cord
- Fuse (FU1)

High voltage generating point

The place where voltage of over 100V is generated.

- Charged section
- Anode voltage 28.6kV
  : at the NTSC mode of SD-T292, and SD-291
  *1 28.9kV
  : at the PAL or SECAM modes of SD-T292
- Focus voltage (7.8kV)
- Screen voltage (650V)
- R.G.B drive circuit (208V)
- Horizontal deflection yoke (900V)
  *1 : The voltage at the PAL or SECAM modes of SD-T292 are reference value.

Point is the charged section.
Point is the high voltage generating points other than the charged section.

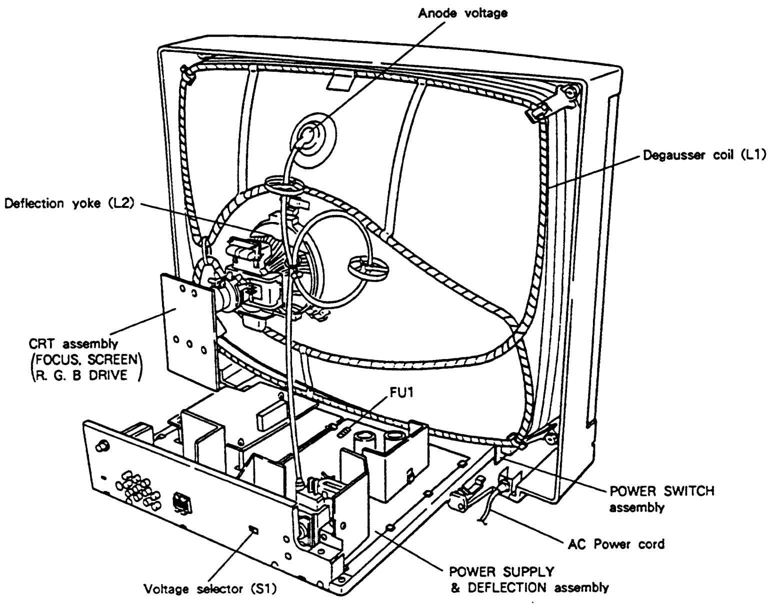


Fig. 3-1 Charged section and high voltage generating point

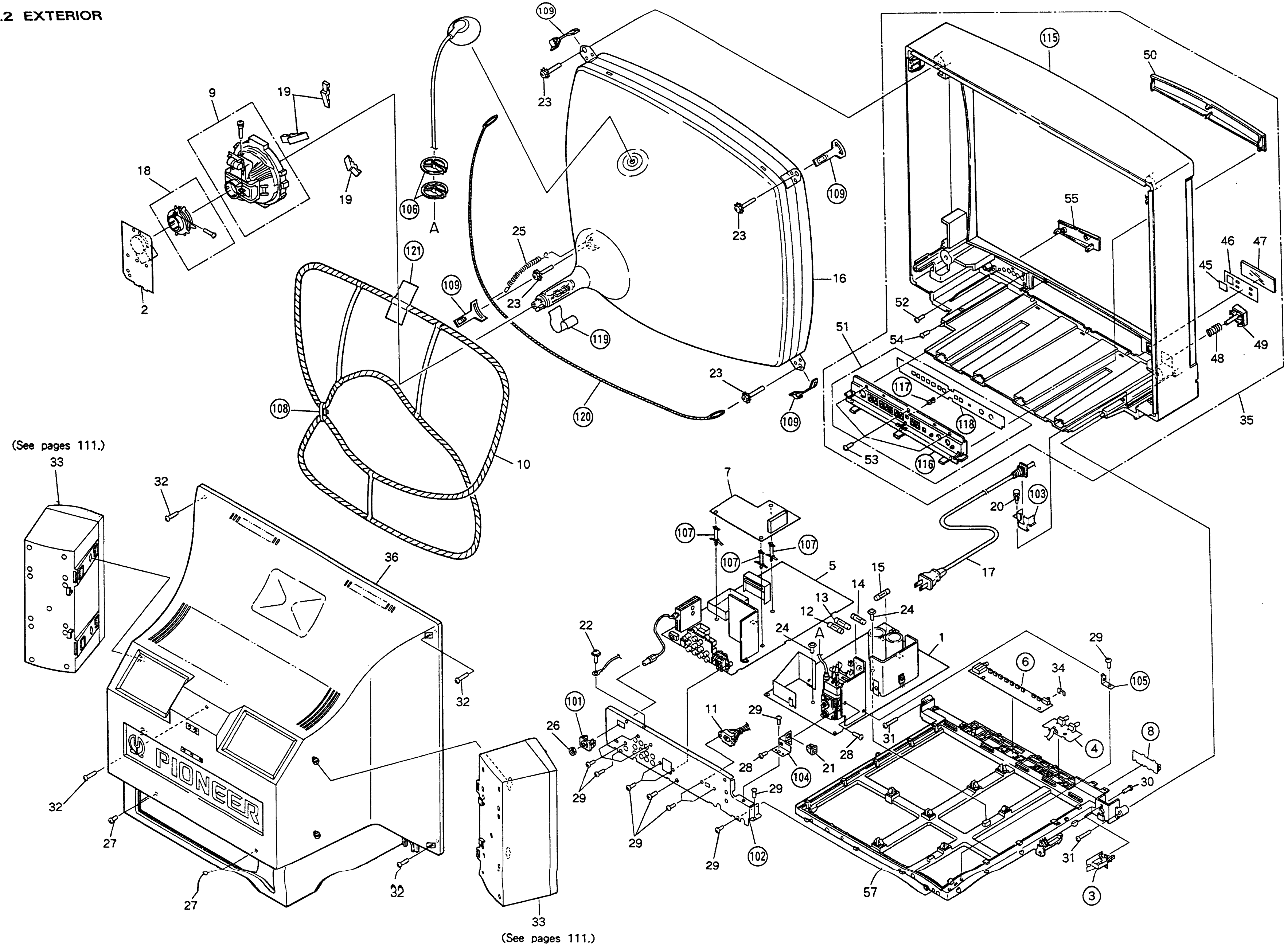
4. EXPLODED VIEW, PACKING AND PARTS LIST

NOTES :
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

4.1 PARTS LIST

Mark	No.	Part No.	Description
	1	AWZ2490	POWER SUPPLY & DEFLECTION assembly
	2	AWZ2491	CRT assembly
	3		POWER SWITCH assembly
	4		FRONT VR assembly
	5	AWZ2494	TV COMPLEX assembly
	6		SW PHONE assembly
	7	AWZ2496	Y/C SYSTEM assembly
	8		LED assembly
⚠	9	ATL1037	Deflection yoke (L2)
⚠	10	ATL1052	Degausser coil (L1)
⚠	11	AKX1004	Voltage selector (S1)
⚠	12	AEK-121	Fuse (1.6A) (FU4)
⚠	13	AEK-125	Fuse (4A) (FU2)
⚠	14	AEK-125	Fuse (4A) (FU3)
⚠	15	AEK-126	Fuse (5A) (FU1)
⚠	16	AAV1088	CRT (V1)
⚠	17	ADG1054	AC power cord
	18	AXE1003	Purity magnet
	19	AEB-260	Rubber wedge
	20	AEC-441	Rivet
	21	AEC1011	Screw grommet
	22	ABA-284	Screw
	23	ABA1001	Bolt
	24	ABA1045	Screw
	25	ABH-122	Spring
	26	ABN-087	Nut
	27	ABZ30P080FZK	Screw
	28	BBZ40P100FMC	Screw
	29	BPZ30P080FZK	Screw
	30	VMZ30P060FMC	Screw
	31	VPZ40P160FMC	Screw
	32	VPZ40P200FZK	Screw
	33	AMR2034	SP assembly
	34	AAK1603	Slide switch cover
	35	AMB1506	Front cabinet assembly
	36	AME1043	Rear case assembly
	37	ARB1184	Operating instructions (English)
	38	ARC1160	Operating instructions (Spanish)
	39	AXD1057	Remote control unit
	40	AHA1032	Sub pad
	41	AHA1157	Top pad assembly
	42	AHB1031	SP sheet
	43	AHD1394	Under carton assembly
	44	AHD1654	Upper carton
	45	AAK1175	IR filter
	46	AEH1008	Sheet
	47	AAK1524	Indicator panel
	48	ABH1039	Coil spring
	49	AAD1294	Power knob
	50	AAN1073	Door assembly
	51	AMR1447	Control cover assembly
	52	VPZ30P060FMC	Screw
	53	VBZ40P100FMC	Screw
	54	VBZ30P100FMC	Screw
	55	AAN1134	Sub cover
	56	AKX1012	Plug adapter
	57	AMA1006	Shassis molding
	101		Antenna holder
	102		Rear panel
	103		AC cord holder
	104		FBT holder
	105		Heat sink holder
	106		Anode clamper
	107		PC support
	108		Binder
	109		Coil holder
	110		Safe guard card
	111		Caution card (220 – 240V)
	112		Battery
	113		Vinyl bag
	114		Mirror mat bag
	115		Front cabinet
	116		Control cover
	117		Catcher
	118		Control plate
	119		Cloth tape
	120		Earth wire
	121		Tape

4.2 EXTERIOR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(See pages 111.)
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Mark	Symbol & Description	Part No.
	C528	CEAS471M35
⚠	C505	CFPHW103H3D
⚠	C506	CFPHW123H3D
⚠	C503	CFPHW272H3D
	C526.C529.C550	CFTXA104J50
	C519.C520	CFTXA224J50
	C924	CFTXA394J50
	C512.C930	CFTXA474J50
	C502	CKCYB222K500
	C510	CKCYB391K500
	C532.C546	CKDYB102K500
	C523	CKDYF103Z50
	C926	CKDYX473M25
	C516	CFTXA824J50
	C535	CQMA104J50
⚠	C504	CQMA123K250
	C927	CQMA222J50
	C525	CQMA223J50
	C533.C941	CQMA273J50
	C501	CQMA563K250
⚠	C508	CQPA274J400
⚠	C507	CQPA393J400
⚠	C509	CQPA474J400

RESISTORS

Mark	Symbol & Description	Part No.
	VR501 Semi-fixed (470Ω)	VRTB6VS471
	VR500 Semi-fixed (10kΩ)	VRTS6VS103
⚠	VR901 Semi-fixed (1kΩ)	VRTS6VS102
⚠	R578 Fusible resistor (2.2Ω/1/4W)	ACN-157
	R905 Solid (2.7MΩ/1/2W)	ACN-158
⚠	R580 Wire-wound (2.7Ω/2W)	ACN1030
	R906.R907.R916 (1Ω/5W)	ACN1032
	R917 (5.6Ω/5W)	ACN1033
	R912.R913 Wire-wound (820Ω/10W)	ACN1047
⚠	R931.R932	RD1/2PMFL330J
	R506.R512.R540.R555.R581.R590, R909.R914.R918.R940.R941	RD1/2PM☐☐☐J
⚠	R575	RD1/4PMFL122J
	R505.R511.R514.R539.R551.R556, R557.R573.R574	RD1/4PM☐☐☐J
⚠	R579	RD1/4PMFL010J
⚠	R565	RN1/4PQ7152F
⚠	R936	RN1/4PQ5101F
⚠	R563	RN1/4PQ7502F
⚠	R937	RN1/4PQ8202F
	R501.R502.R504	RS1LMF☐☐☐J
	R500.R513.R554.R910.R911.R923, R924.R939	RS2LMF☐☐☐J
	R507	RS1LMFR22J
	R908	RS2LMFR22J
	Other resistors	RD1/8PM☐☐☐J

OTHERS

Mark	Symbol & Description	Part No.
⚠	SG901.SG902 Surge arrester	AEX1008

CRT Assembly (AWZ2491)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	Q850.Q855 – Q857	2SA933S
	Q851 – Q853	2SC1740S
	Q854	2SC2668
	Q858 – Q860	2SC3942
	D854	RD12ESB2
	D850.D851.D857.D859 – D861	1SS252

COILS

Mark	Symbol & Description	Part No.
	L853 – L855	LAU221K
	L850 – L852	LAU560K

CAPACITORS

Mark	Symbol & Description	Part No.
⚠	C861 (2200p/2kV)	ACG-034
⚠	C857 (22μ/250V)	ACH-395
	C851.C853.C855	CCCSL270J50
	C850	CEAS100M25
	C860	CEAS101M16
	C858	CKCYF103Z50
⚠	C859	CKCYB222K500
	C852.C854.C856	CKCYB391K50

RESISTORS

Mark	Symbol & Description	Part No.
	VR850.VR851 Semi-fixed (500Ω/0.1W)	ACP-106
	VR852-VR854 Semi-fixed (10kΩ/0.1W)	ACP-105
⚠	R879.R882.R885 Solid (2.2kΩ/1/2W)	ACN-194
	R868	RD1/2PMFL100J
	R867	RD1/4PM225J
	R886	RS2PMF4R7J
	R877.R880.R883	RS3LMF103J
	R884	RD1/2PM390J
	Other resistors	RD1/8PM☐☐☐J

OTHERS

Mark	Symbol & Description	Part No.
⚠	CRT Socket	AKG1003

Y/C SYSTEM Assembly (AWZ2496)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC810	M5223P
	IC812	TA8615N
	IC750	TC4052BP
	IC751	TDA4563
	IC811	UPC1391H
	Q753	2SA933S
	Q812	2SC2878
	Q1 – Q3.Q750 – Q752, Q754 – Q757.Q759 – Q762, Q764.Q810.Q811	2SC1740S
	D750	1SS252

COILS AND FILTERS

Mark	Symbol & Description	Part No.
	L751 Tuning coil	ATG1006
	L756 Trap coil	ATG1008
	L813 Tuning coil	ATG1028
	L810 Tuning coil	ATG1030
	L750 (15μH)	ATH1013
	L755	LAU120K
	L753	LAU150K
	L752	LAU330K
	L759	LAU270K
	L761	LAU3R3K
	L758	LAU470K
	L757.L760	LAU560K
	L1.L2.L814	LAU680K
	L754	LAU8R2K
	F1.F810 Ceramic filter	ATF-166
	F811 Ceramic filter	ATF1047
	F2.F812 Ceramic filter	ATF1048
	F813 Ceramic filter	ATF1049

CAPACITORS

Mark	Symbol & Description	Part No.
	C757	CCCCH101J50
	C812	CCCCH150J50
	C765	CCCCH180J50
	C754.C768.C823	CCCCH220J50
	C766	CCCCH330J50
	C822	CCCCH470J50
	C762.C767	CCCCH560J50
	C760.C761	CCCCH680J50
	C756	CCCCH820J50
	C780.C781	CCCSL101J50
	C759	CCCSL271J50
	C779	CCCSL680J50
	C777.C778	CCCSL820J50
	C775.C776.C824	CEAS010M50
	C758.C764.C772.C820	CEAS100M25
	C830	CEAS100M50
	C750.C753.C770.C784	CEAS470M16
	C751.C755.C763.C769.C771.C773, C785.C827	CKCYF103Z50
	C811	CKDYB102K50
	C828.C829	CKDYB471K50
	C1 – C3.C810.C813 – C815, C818.C819.C821.C826.C831, C832	CKDYF103Z50
	C816	CKDYX104M25

RESISTORS

Mark	Symbol & Description	Part No.
	VR750 Semi-fixed (470Ω)	VRTB6VS471
	R816.R823	RD1/4PM101J
	Other resistors	RD1/8PM☐☐☐J

OTHERS

Mark	Symbol & Description	Part No.
	X810 Ceramic resonator (500kHz)	ASS-019
	DL750 Delay line	ATN1011
	DL751.DL752 Delay line	ATN1012
	7P Jumper connector	KPC7
	9P Jumper connector	KPC9

SW PHONE Assembly

SWITCHES

Mark	Symbol & Description	Part No.
	S980 – S988 Tact switch (ADD, ERASE, CHANNEL (+, −), VOLUME (+, −), COLOR SYSTEM, PICTURE MEMORY, POWER ON & FUNCTION)	ASG1022
	S989 Slide switch (CHANNEL PLAN)	ASH1023

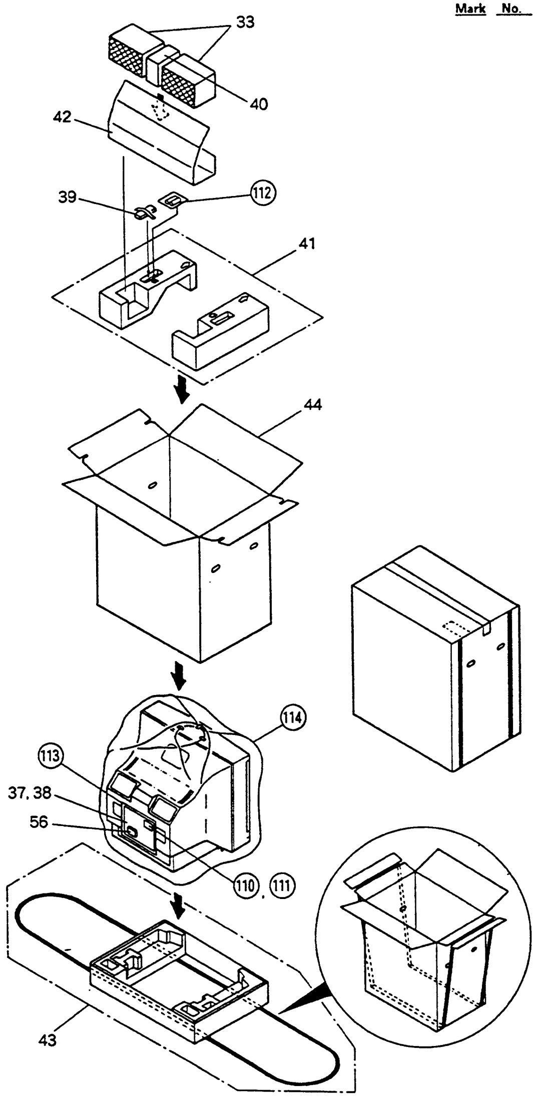
RESISTORS

Mark	Symbol & Description	Part No.
	R982.R983	RD1/2PM331J
	R980.R981	RD1/8PM222J

OTHERS

Mark	Symbol & Description	Part No.
	Headphone jack (PHONES)	AKN-049

4.3 PACKING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110, 111
43

Parts List of Remote control

Mark	No.	Part No.	Description
		AZN1459	Battery cover

5. ELECTRICAL PARTS LIST

NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "◎" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560 Ω→56 × 10¹ →561 ········ RD1/4PS$\boxed{5}\boxed{6}\boxed{1}$J
47k Ω→47 × 10³ →473 ········ RD1/4PS$\boxed{4}\boxed{7}\boxed{3}$J
0.5 Ω→0R5 ········ RN2H$\boxed{0}\boxed{R}\boxed{5}$K
1 Ω→010 ········ RS1P$\boxed{0}\boxed{1}\boxed{0}$K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω→562 × 10¹ →5621 ········ RN1/4SR$\boxed{5}\boxed{6}\boxed{2}\boxed{1}$F

Miscellaneous Parts

P.C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
	POWER SWITCH assembly	
	LED assembly	
	FRONT VR assembly	
	TV COMPLEX assembly	AWZ2494
	POWER SUPPLY & DEFLECTION assembly	AWZ2490
	CRT assembly	AWZ2491
	Y/C SYSTEM assembly	AWZ2496
	SW PHONE assembly	

OTHERS

Mark	Symbol & Description	Part No.
⚠	L2 Deflection yoke	ATL1037
⚠	L1 Degausser coil	ATL1052
⚠	S1 Voltage selector	AKX1004
⚠	V1 CRT	AAV1088
⚠	FU4 Fuse (1.6A/125V)	AEK-121
⚠	FU2,FU3 Fuse (4A/125V)	AEK-125
⚠	FU1 Fuse (5A/125V)	AEK-126
	SP assembly	AMR1745
	Remote control unit	AXD1057
⚠	AC power cord	ADG1054

POWER SWITCH Assembly

SWITCH

Mark	Symbol & Description	Part No.
⚠	S950 Push switch (MAIN POWER)	ASG1007

CAPACITORS

Mark	Symbol & Description	Part No.
⚠	C950 (0.01μ/AC250V)	ACE-501

LED Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	D961	AEL-460
	D960	AEL-463
	D962,D963	AEL1003
	D964	1SS252

RESISTORS

Mark	Symbol & Description	Part No.
	R961	RD1/2PM561J
	R960	RD1/8PM151J

OTHERS

Mark	Symbol & Description	Part No.
	Remote control sensor unit	AXX1006

FRONT VR Assembly

RESISTORS

Mark	Symbol & Description	Part No.
	VR895,VR896 Variable resistor (500Ω) (WHITE BALANCE RED, GREEN)	ACS1023
	VR700 Semi-fixed (5kΩ/1/3W) (SUB-BRIGHT)	ACP1033
	Other resistors	RD1/8PM□□□J

TV COMPLEX Assembly (AWZ2494)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC201	CXK1008L
	IC600	CX20125
	IC400	M51321P
	IC12	M51365SP
	IC401	M5222L
	IC14	NJM7805A
	IC300	NJM7809A
	IC200	PD5085-A
	IC13	SBX1475-11
	IC402	TA8200AH
	IC601	TA8659AN
	IC403	TC4066BP
	IC11	TD6359P
	IC404	UPC7812H
	IC230	UPD6143C-001
	IC250	UPD6326C
	Q31	RN1201
	Q32 – Q34	RN1203
	Q40	RN2203
	Q11 – Q13,Q18,Q22,Q27,Q276, Q400,Q601,Q602,Q606,Q607	2SA933S
	Q14,Q21,Q24 – Q26,Q28 – Q30, Q35 – Q39,Q41,Q45,Q201,Q202, Q230,Q270 – Q274,Q330,Q331, Q401 – Q411,Q600,Q603 – Q605, Q608 – Q612	2SC1740S
	Q15 – Q17,Q23	2SC2668
	Q200	2SD438
	Q44	2SJ103
	Q42,Q43	2SK246
	D403	RD2.7ESB2
	D201	RD3.3ESB2
	D33	RD30ESB2
	D407,D604,D605	RD5.1ESB3
	D200,D232,D330	RD5.6ESB2
	D412,D413	RD6.8ESB
	D610	RD7.5ESB2
	D601	RD9.1ESB
	D11,D17 – D19,D31,D32, D202 – D204,D231,D400 – D402, D404 – D406,D410,D411,D414, D600,D602,D603	1SS252
	D12 – D15,D20,D21	1SS85

SWITCH

Mark	Symbol & Description	Part No.
	S200 Slide switch (AFT)	ASH1009

COILS AND FILTERS

Mark	Symbol & Description	Part No.
	L22 Tuning coil	ATC-231
	L23 Tuning coil	ATC-250
	L606 Tuning coil	ATG1009
	L608 Tuning coil	ATG1026
	L609,L610 Tuning coil	ATG1027
	L25 Tuning coil	ATG1030
	L16 Tuning coil	ATG1031
	L607 Tuning coil	ATG1033
	L400,L401 AF choke coil (1μH)	ATH-133
	L602	LAU101K
	L19	LAU150K
	L28,L29,L31 – L35	LAU2R2M
	L603,L604	LAU270K
	L613	LAU4R7K
	L17,L18,L24	LAU5R6K
	L230	LAU560J
	L612	LAU560K
	L26,L600	LAU100K
	L30	LAU120K
	L20,L21	LAU6R8K
	L605	LAU8R2K
	L601	LAU820K
	L27	LTA472J
	F13 Ceramic trap	ATF-114
	F15 Ceramic trap	ATF-172
	F14 Ceramic trap	ATF-174
	F11 SAW filter	ATF1020
	F17 Bandpass filter	ATF1021
	F19 Trap filter	ATF1051
	F18 Trap filter	ATF1052
	F12 Trap filter	ATF1053
	F16 Ceramic trap	ATF1054
	F20 Trap filter	ATF1063

CAPACITORS

Mark	Symbol & Description	Part No.
	C661	CCCCH070D50
	C671	CCCCH080D50
	C676,C677	CCCCH560J50
	C608	CCCCH680J50
	C669,C675	CCCCH820J50
	C238	CCCSL101J50
	C663,C664	CCCSL181J50
	C637	CCCSL271J50
	C610	CCCSL330J50
	C615,C665	CCCSL680J50
	C35,C36	CCDCH010C50
	C31,C32	CCDCH020C50
	C29,C30,C33,C34	CCDCH030C50
	C55	CCDCH050C50
	C37,C639	CCDCH150J50

Mark	Symbol & Description	Part No.
	C98	CCDCH180J50
	C40,C233,C658,C662	CCDCH220J50
	C25,C38,C78,C646,C668	CCDCH270J50
	C24,C232,C640	CCDCH330J50
	C54	CCDCH390J50
	C39,C97	CCDCH560J50
	C49,C672	CCDRH270J50
	C47	CCDRH560J50
	C76,C86	CCDSL121J50
	C84,C612	CCDSL221J50
	C604,C607	CCDSL390J50
	C20 – C22,C240	CCDSL470J50
	C80,C643	CEANP2R2M50
	C91,C92	CEANPR22M50
	C48,C65,C617,C653,C667	CEASR47M50
	C611	CEASR68M50
	C53,C79,C85,C203,C401,C402, C404,C405,C408,C606,C613,C621, C635,C652,C657	CEAS010M50
	C60,C77,C83,C89,C438,C440, C450,C600,C609,C623	CEAS100M25
	C618	CEAS6R8M50
	C109	CEAS100M50
	C27,C46,C72,C94,C101,C104,C409, C620,C631,C660	CEAS101M16
	C432	CEAS101M35
	C410	CEAS102M10
	C436,C437	CEAS102M25
	C201	CEAS102M6
	C411 – C414,C416,C417,C421, C422	CEAS2R2M50
	C400,C403,C407,C602	CEAS220M25
	C26	CEAS220M50
	C14,C415,C423,C426	CEAS221M16
	C12	CEAS3R3M50
	C331,C443,C444,C601,C603, C622	CEAS4R7M50
	C28,C52,C64,C68,C88,C90,C200, C206,C208,C230,C250,C252,C406, C427,C428,C442	CEAS470M16
	C75	CEAS471M16
	C624 – C629	CFTXA104J50
	C451,C452,C632	CFTXA224J50
	C638	CFTXA394J50
	C96,C332	CFTXA474J50
	C435,C605,C654	CKCYB102K50
	C619,C630,C634,C642,C644, C648 – C651,C655,C656	CKCYB103K50
	C270	CKCYB392K50
	C234 – C236,C616,C666	CKCYB471K50
	C614	CKCYB561K50
	C237	CKCYB681K50
	C202,C207,C209,C231,C251,C253, C330,C418,C431,C439,C441,C446	CKCYF103Z50
	C13,C18,C19,C42 – C45,C58,C59, C66,C67,C73,C74,C93,C95,C99, C100,C102,C103	CKDYB102K50
	C11,C15,C23,C50,C51,C56,C57, C61 – C63,C69,C70,C81,C87, C110,C333,C334	CKDYF103Z50
	C71	CKDYX473M25
	C429,C430	CQMA124K50
	C17	CQMA154K50
	C636	CQMA223K50
	C16	CQMA333K50
	C673,C960	CQMA104J50
	C239	CQMA471J50
	C633	CQMA822K50
	C641,C645,C647	CQMA563K50
	C961	CQMA823K50

RESISTORS

Mark	Symbol & Description	Part No.
	VR601 Semi-fixed (470Ω)	VRTB6VS471
	VR11 Semi-fixed (4.7kΩ)	VRTB6VS472
	VR13 Semi-fixed (47kΩ)	VRTB6VS473
	VR600 Semi-fixed (100kΩ)	VRTS6VS104
	VR12 Semi-fixed (4.7kΩ)	VRTS6VS472
	R275,R277,R423,R466,R467,R665	RD1/2PM□□□J
⚠	R24,R464,R465	RD1/4PMFL100J
⚠	R462,R463	RD1/4PMFL2R2J
⚠	R12,R94,R95	RD1/4PMFL101J
	R71,R119	RD1/4PM□□□J
	R343	RS1LMF150J
	R201,R202,R422	RS2LMF□□□J
⚠	R40	RS2LMF680J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	X11 Crystal resonator (4.0MHz)	ASS-013
	X601 Crystal resonator (3.579545MHz)	ASS-028
	X602 Crystal resonator (4.433619MHz)	ASS-041
	X600 Ceramic resonator (4.19MHz)	ASS1003
	X200 Ceramic resonator (4.0MHz)	ASS1025
	DL600 Delay line	ATN1019
	TV Front end	AXF1022
	Coaxial cable with pin plug	ADE1044
	11P pin jack	AKB1030
	4P speaker terminal	AKE1007
	4P mini DIN socket	AKP1017
	Coaxial cable assembly	ADE1045

POWER SUPPLY
& DEFLECTION Assembly (AWZ2490)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
⚠	TH901,TH902 Posistor	AEX-020
	IC500	AN5521
⚠	IC922	PC111S
	IC901	UPC78M12H
	Q505,Q509,Q510,Q515,Q516,Q520, Q907	2SA933S
⚠	Q903	2SB824
	Q502,Q503,Q506 – Q508, Q511 – Q514,Q517 – Q519, Q904 – Q906,Q908 – Q910	2SC1740S
⚠	Q500	2SC3332
⚠	Q902	2SC3461
⚠	Q504	2SD1276A
⚠	Q501	2SD1556
	Q901	2SD438
⚠	D505	CTU-G2DR
	D913	HZS18-1L
	D912	HZS6A3L
⚠	D921	HZS6C2L
	D519,D521	HZS6C2L
	D520	HZS6C3L
⚠	D904	LB154-B
	D511	RD11ESB1
	D517,D518	RD2.7ESB1
	D503,D504	RD20ESB2
	D512	RD22ESB
	D911	RD24EB
	D508	RD7.5ESB1
	D515	RF1
⚠	D918	RG4A
⚠	D917	31DF2FC
⚠	D916	RL4Z
⚠	D906	RP1H
	D502,D514	RU1
⚠	D506	RU4A
⚠	D901	S1YB10
	D509,D510,D513,D516,D902,D903, D909,D910,D914,D915,D919,D920	1SS252
⚠	D905,D907,D908	11DF1FD
	D500,D501,D507	11E2
	D522,D525	RD33ESB

RELAY

Mark	Symbol & Description	Part No.
⚠	RY901 Relay	ASR-512

COILS AND TRANSFORMERS

Mark	Symbol & Description	Part No.
⚠	L901,L902 Line filter	ATF1001
⚠	L903,L904 Coil (100μH)	ATH1042
⚠	L500 Coil (390μH)	ATH1035
⚠	L501 Linearity coil	ATL1060
⚠	L502,L912 Ferrite bead	ATX-028
⚠	T500 Horiz drive transformer	ATK1030
⚠	T501 Flyback transformer	ATK1032
⚠	T902 Converter transformer	ATK1034
⚠	T901 Power transformer	ATT1098

CAPACITORS

Mark	Symbol & Description	Part No.
⚠	C905 – C907 (0.1μ/AC250V)	ACE-507
⚠	C918,C922 (1000p/2kV)	ACG-040
⚠	C920 (0.01μ/1kV)	ACG-045
⚠	C921,C928,C929,C935,C938,C940 (220p/2kV)	ACG-050
⚠	C910 – C913 (4700p/AC250V)	ACG-503
⚠	C908,C909,C916,C917 (2200p/400V)	ACG-507
⚠	C934 (330μ/160V)	ACH-271
⚠	C549 (1μ/160V)	ACH-372
⚠	C537,C919 (2.2μ/350V)	ACH-371
⚠	C545 (4.7μ/160V)	ACH-380
⚠	C937 (330μ/25V)	ACH1013
⚠	C923 (47μ/100V)	ACH1048
⚠	C511 (4.7μ/50V)	ACH1072
⚠	C914,C915 (470μ/200V)	ACH1125
	C524	CCCSL121J50
	C522	CCCSL820K500
	C514	CEANP100M25
	C534	CEANP6R8M50
	C513	CEASR47M50
	C518,C521,C540	CEAS100M25
	C903	CEAS101M16
	C500,C527,C539	CEAS101M35
	C538	CEAS102M35
	C531,C551	CEAS220M25
	C536	CEAS220M50
	C901	CEAS221M35
	C936	CEAS222M25
	C939	CEAS222M50
	C530	CEAS332M25
	C932	CEAS4R7M50
	C515,C517	CEAS470M16
	C902	CEAS470M25
	C931	CEAS470M50

Mark	Symbol & Description	Part No.
	C528	CEAS471M35
⚠	C505	CFPHW103H3D
⚠	C506	CFPHW123H3D
⚠	C503	CFPHW272H3D
	C526,C529,C550	CFTXA104J50
	C519,C520	CFTXA224J50
	C924	CFTXA394J50
	C512,C930	CFTXA474J50
	C502	CKCYB222K500
	C510	CKCYB391K500
	C532,C546	CKDYB102K500
	C523	CKDYF103Z50
	C926	CKDYX473M25
	C516	CFTXA824J50
	C535	CQMA104J50
⚠	C504	CQMA123K250
	C927	CQMA222J50
	C525	CQMA223J50
	C533,C941	CQMA273J50
	C501	CQMA563K250
⚠	C508	CQPA274J400
⚠	C507	CQPA393J400
⚠	C509	CQPA474J400

RESISTORS

Mark	Symbol & Description	Part No.
	VR501 Semi-fixed (470Ω)	VRTB6VS471
	VR500 Semi-fixed (10kΩ)	VRTS6VS103
⚠	VR901 Semi-fixed (1kΩ)	VRTS6VS102
⚠	R578 Fusible resistor (2.2Ω/1/4W)	ACN-157
	R905 Solid (2.7MΩ/1/2W)	ACN-158
⚠	R580 Wire-wound (2.7Ω/2W)	ACN1030
	R906,R907,R916 (1Ω/5W)	ACN1032
	R917 (5.6Ω/5W)	ACN1033
	R912,R913 Wire-wound (820Ω/10W)	ACN1047
⚠	R931,R932	RD1/2PMFL330J
	R506,R512,R540,R555,R581,R590, R909,R914,R918,R940,R941	RD1/2PM□□□J
⚠	R575	RD1/4PMFL122J
	R505,R511,R514,R539,R551,R556, R557,R573,R574	RD1/4PM□□□J
⚠	R579	RD1/4PMFL010J
⚠	R565	RN1/4PQ7152F
⚠	R936	RN1/4PQ5101F
⚠	R563	RN1/4PQ7502F
⚠	R937	RN1/4PQ8202F
	R501,R502,R504	RS1LMF□□□J
	R500,R513,R554,R910,R911,R923, R924,R939	RS2LMF□□□J
	R507	RS1LMFR22J
	R908	RS2LMFR22J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
⚠	SG901,SG902 Surge arrester	AEX1008

CRT Assembly (AWZ2491)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	Q850,Q855 – Q857	2SA933S
	Q851 – Q853	2SC1740S
	Q854	2SC2668
	Q858 – Q860	2SC3942
	D854	RD12ESB2
	D850,D851,D857,D859 – D861	1SS252

COILS

Mark	Symbol & Description	Part No.
	L853 – L855	LAU221K
	L850 – L852	LAU560K

CAPACITORS

Mark	Symbol & Description	Part No.
⚠	C861 (2200p/2kV)	ACG-034
⚠	C857 (22μ/250V)	ACH-395
	C851,C853,C855	CCCSL270J50
	C850	CEAS100M25
	C860	CEAS101M16
	C858	CKCYF103Z50
⚠	C859	CKCYB222K500
	C852,C854,C856	CKCYB391K50

RESISTORS

Mark	Symbol & Description	Part No.
	VR850,VR851 Semi-fixed (500Ω/0.1W)	ACP-106
	VR852-VR854 Semi-fixed (10kΩ/0.1W)	ACP-105
⚠	R879,R882,R885 Solid (2.2kΩ/1/2W)	ACN-194
	R868	RD1/2PMFL100J
	R867	RD1/4PM225J
	R886	RS2PMF4R7J
	R877,R880,R883	RS3LMF103J
	R884	RD1/2PM390J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
⚠	CRT Socket	AKG1003

Y/C SYSTEM Assembly (AWZ2496)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC810	M5223P
	IC812	TA8615N
	IC750	TC4052BP
	IC751	TDA4563
	IC811	UPC1391H
	Q753	2SA933S
	Q812	2SC2878
	Q1 – Q3,Q750 – Q752, Q754 – Q757,Q759 – Q762, Q764,Q810,Q811	2SC1740S
	D750	1SS252

COILS AND FILTERS

Mark	Symbol & Description	Part No.
	L751 Tuning coil	ATG1006
	L756 Trap coil	ATG1008
	L813 Tuning coil	ATG1028
	L810 Tuning coil	ATG1030
	L750 (15μH)	ATH1013
	L755	LAU120K
	L753	LAU150K
	L752	LAU330K
	L759	LAU270K
	L761	LAU3R3K
	L758	LAU470K
	L757,L760	LAU560K
	L1,L2,L814	LAU680K
	L754	LAU8R2K
	F1,F810 Ceramic filter	ATF-166
	F811 Ceramic filter	ATF1047
	F2,F812 Ceramic filter	ATF1048
	F813 Ceramic filter	ATF1049

CAPACITORS

Mark	Symbol & Description	Part No.
	C757	CCCCH101J50
	C812	CCCCH150J50
	C765	CCCCH180J50
	C754,C768,C823	CCCCH220J50
	C766	CCCCH330J50
	C822	CCCCH470J50
	C762,C767	CCCCH560J50
	C760,C761	CCCCH680J50
	C756	CCCCH820J50
	C780,C781	CCCSL101J50
	C759	CCCSL271J50
	C779	CCCSL680J50
	C777,C778	CCCSL820J50
	C775,C776,C824	CEAS010M50
	C758,C764,C772,C820	CEAS100M25
	C830	CEAS100M50
	C750,C753,C770,C784	CEAS470M16
	C751,C755,C763,C769,C771,C773, C785,C827	CKCYF103Z50
	C811	CKDYB102K50
	C828,C829	CKDYB471K50
	C1 – C3,C810,C813 – C815, C818,C819,C821,C826,C831, C832	CKDYF103Z50
	C816	CKDYX104M25

RESISTORS

Mark	Symbol & Description	Part No.
	VR750 Semi-fixed (470Ω)	VRTB6VS471
	R816,R823	RD1/4PM101J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	X810 Ceramic resonator (500kHz)	ASS-019
	DL750 Delay line	ATN1011
	DL751,DL752 Delay line	ATN1012
	7P Jumper connector	KPC7
	9P Jumper connector	KPC9

SW PHONE Assembly

SWITCHES

Mark	Symbol & Description	Part No.
	S980 – S988 Tact switch (ADD, ERASE, CHANNEL (+, −), VOLUME (+, −), COLOR SYSTEM, PICTURE MEMORY, POWER ON & FUNCTION)	ASG1022
	S989 Slide switch (CHANNEL PLAN)	ASH1023

RESISTORS

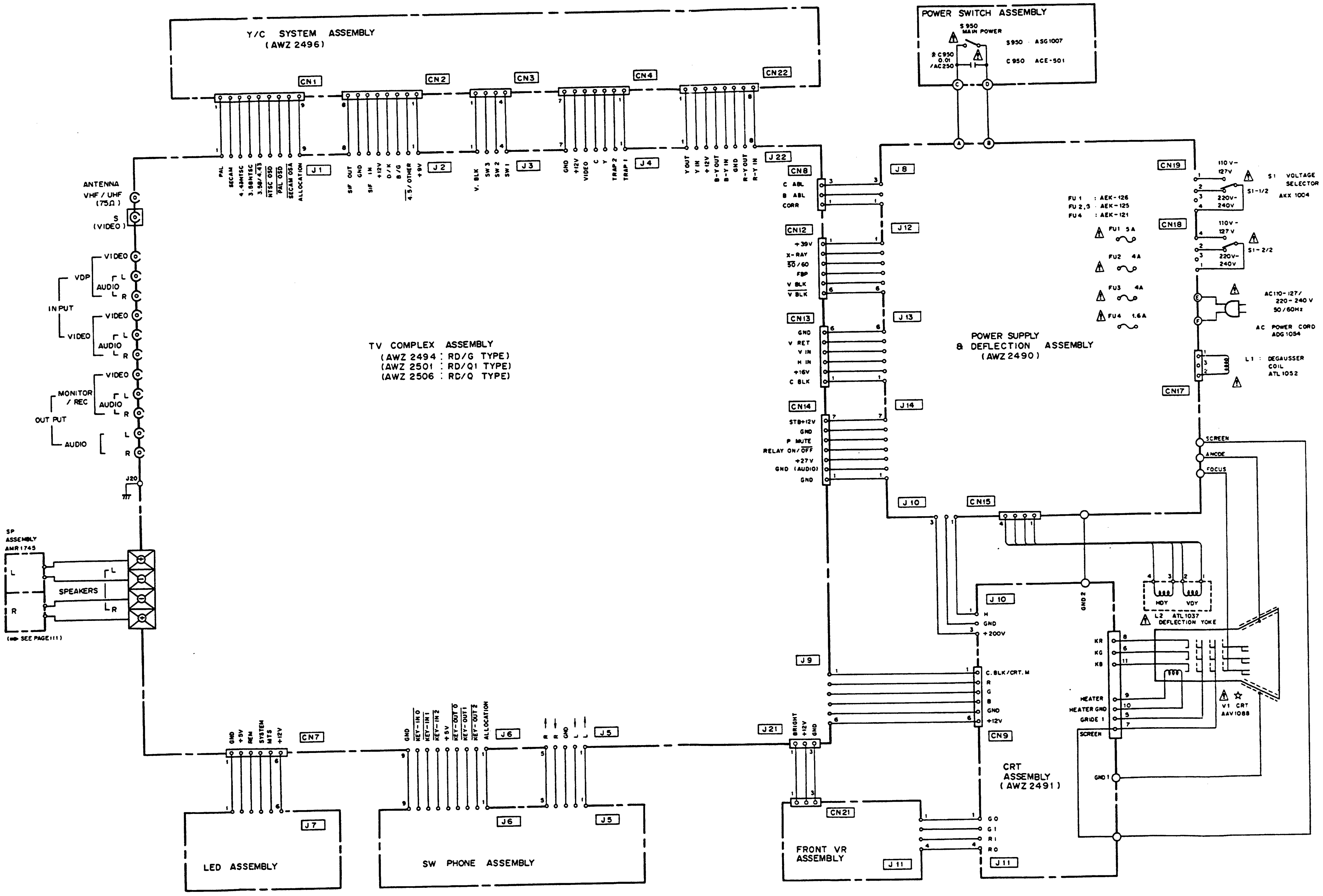
Mark	Symbol & Description	Part No.
	R982,R983	RD1/2PM331J
	R980,R981	RD1/8PM222J

OTHERS

Mark	Symbol & Description	Part No.
	Headphone jack (PHONES)	AKN-049

6. SCHEMATIC AND P. C. BOARDS DIAGRAMS

6.1 OVERALL WIRING DIAGRAM


Y/C SYSTEM ASSEMBLY (AWZ 2496)
CN1
CN2
CN3
CN4
CN22
J1
PAL
SECAM
4.43NTSC
3.58NTSC
3.58/4.43
NTSC OSD
PAL OSD
SECAM OSA
ALLOCATION
J2
SIF OUT
GND
SIF IN
+12V
D/K
B/G
4.5/OTHER
+9V
J3
V. BLK
SW3
SW2
SW1
J4
GND
+12V
VIDEO
C
Y
TRAP 2
TRAP 1
J22
Y OUT
Y IN
+12V
B-Y OUT
B-Y IN
GND
R-Y OUT
R-Y IN
ANTENNA VHF / UHF (75Ω)
S (VIDEO)
INPUT
VDP
VIDEO
AUDIO L R
VIDEO
VIDEO
AUDIO L R
OUT PUT
MONITOR / REC
VIDEO
AUDIO L R
AUDIO L R
J20
SP ASSEMBLY AMR1745
L
R
SPEAKERS L R
(⇒ SEE PAGE111)
TV COMPLEX ASSEMBLY
(AWZ 2494 : RD/G TYPE)
(AWZ 2501 : RD/Q1 TYPE)
(AWZ 2506 : RD/Q TYPE)
CN8
C ABL
B ABL
CORR
J8
CN12
+39V
X-RAY
50/60
FBP
V BLK
V BLK
J12
CN13
GND
V RET
V IN
H IN
+16V
C BLK
J13
CN14
STB+12V
GND
P MUTE
RELAY ON/OFF
+27V
GND (AUDIO)
GND
J14
POWER SWITCH ASSEMBLY
S950 MAIN POWER
C950 0.01 /AC250
S950 ASG1007
C950 ACE-501
POWER SUPPLY & DEFLECTION ASSEMBLY (AWZ 2490)
FU1 : AEK-126
FU2,3 : AEK-125
FU4 : AEK-121
FU1 5A
FU2 4A
FU3 4A
FU4 1.6A
CN19
110V-127V
220V-240V
S1 VOLTAGE SELECTOR AKX 1004
S1-1/2
CN18
110V-127V
220V-240V
S1-2/2
AC110-127/220-240V 50/60Hz
AC POWER CORD ADG1054
L1 : DEGAUSSER COIL ATL1052
CN17
SCREEN
ANODE
FOCUS
J10
CN15
HDY
VDY
L2 ATL1037 DEFLECTION YOKE
GND2
J10
H
GND
+200V
J9
C.BLK/CRT.M
R
G
B
GND
+12V
CN9
KR
KG
KB
HEATER
HEATER GND
GRIDE 1
SCREEN
V1 CRT AAV1088
GND1
CRT ASSEMBLY (AWZ 2491)
J21
BRIGHT
+12V
GND
CN21
FRONT VR ASSEMBLY
J11
G0
G1
R1
R0
J11
CN7
GND
+5V
REM
SYSTEM
MTS
+12V
J7
LED ASSEMBLY
J6
GND
KEY-IN0
KEY-IN1
KEY-IN2
+5V
KEY-OUT0
KEY-OUT1
KEY-OUT2
ALLOCATION
J5
R
R
GND
L
L
J6
J5
SW PHONE ASSEMBLY

6.2 SCHEMATIC DIAGRAM

1. RESISTORS :
Indicated in Ω, 1/4W, 1/6W and 1/8W, ±5% tolerance unless otherwise noted k ; kΩ, M ; MΩ, (F) ; ±1%, (G) ; ±2%, (K) ; ±10%, (M) ; ±20% tolerance.

2. CAPACITORS :
Indicated in capacity (μF)/voltage (V) unless otherwise noted p;pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT :
▭ ; DC voltage (V) at color bar signal input.
Value in ( ) is DC voltage at rated power.
⇦mA ; DC current at color bar signal input.
- Letters in each voltage indicate the signal mode as follows ;
Tuner section (at the color bar signal 80dBμ input)
Not marked : M, B/G, I, D/K modes are common used
M : M mode
B : B/G mode
I : I mode
D : D/K mode
O : B/G, I, D/K mode
Other section (at the color bar signal VDP input)
Not marked : NTSC, PAL, SECAM systems are commo
(Measurement value is at the NTSC system)
N : NTSC system
P : PAL system
S : SECAM system

4. OTHERS :
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.
▶ : Measurement point

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. ☆ mark : important parts related with X-RAY radiation.

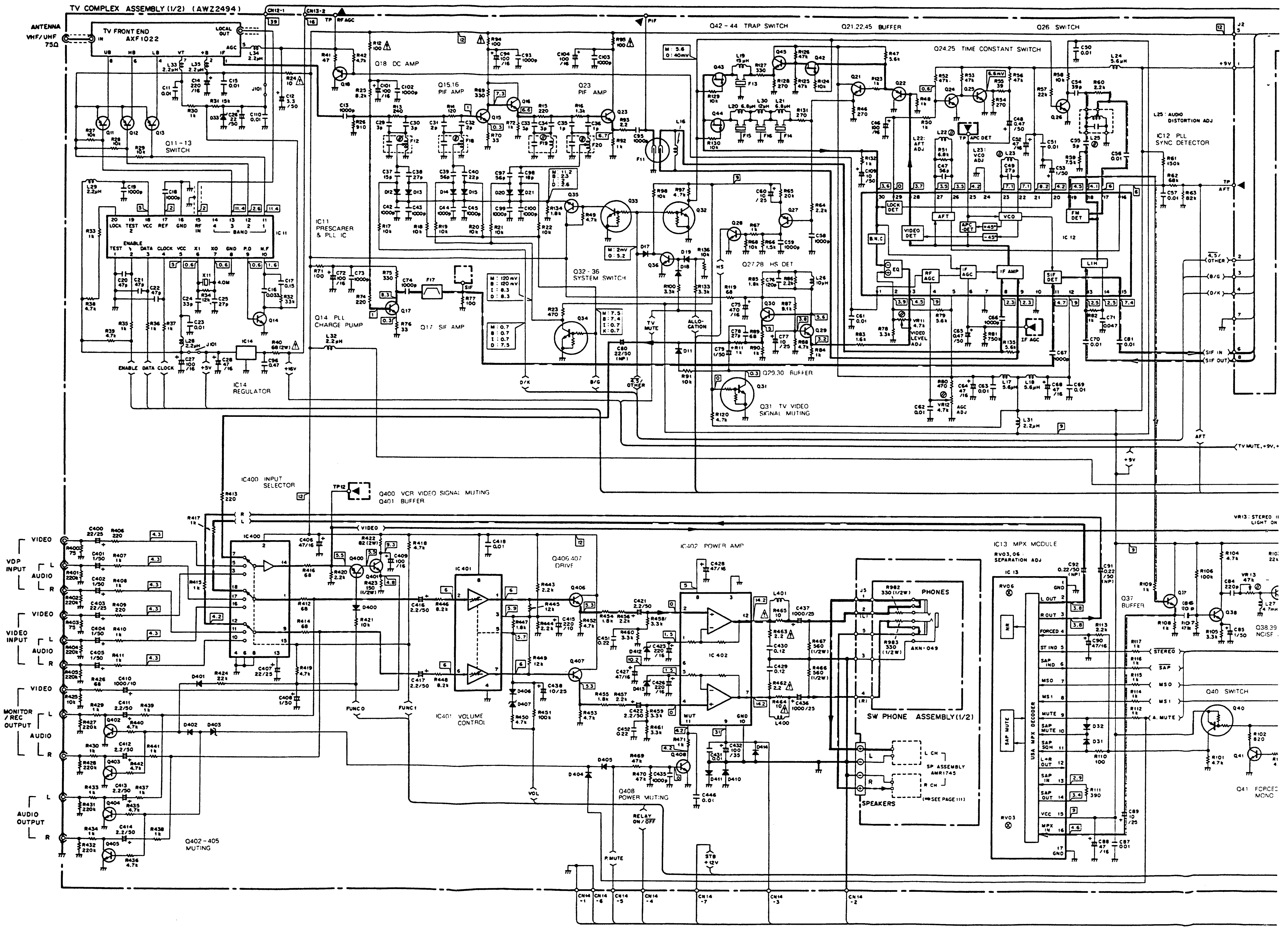
6. SIGNAL RUTE
- Signal route are at the M mode NTSC signal.
CHARGED SECTION
——— VIDEO SIGNAL ROUTE
——— COLOR SIGNAL ROUTE
- - - - V.DEFLECTION ROUTE
- - - - H.DEFLECTION ROUTE
R.SIGNAL ROUTE
G.SIGNAL ROUTE
B.SIGNAL ROUTE
— — — AUDIO L CH ROUTE
— — — AUDIO R CH ROUTE
— — — AUDIO COMPOSITE ROUTE

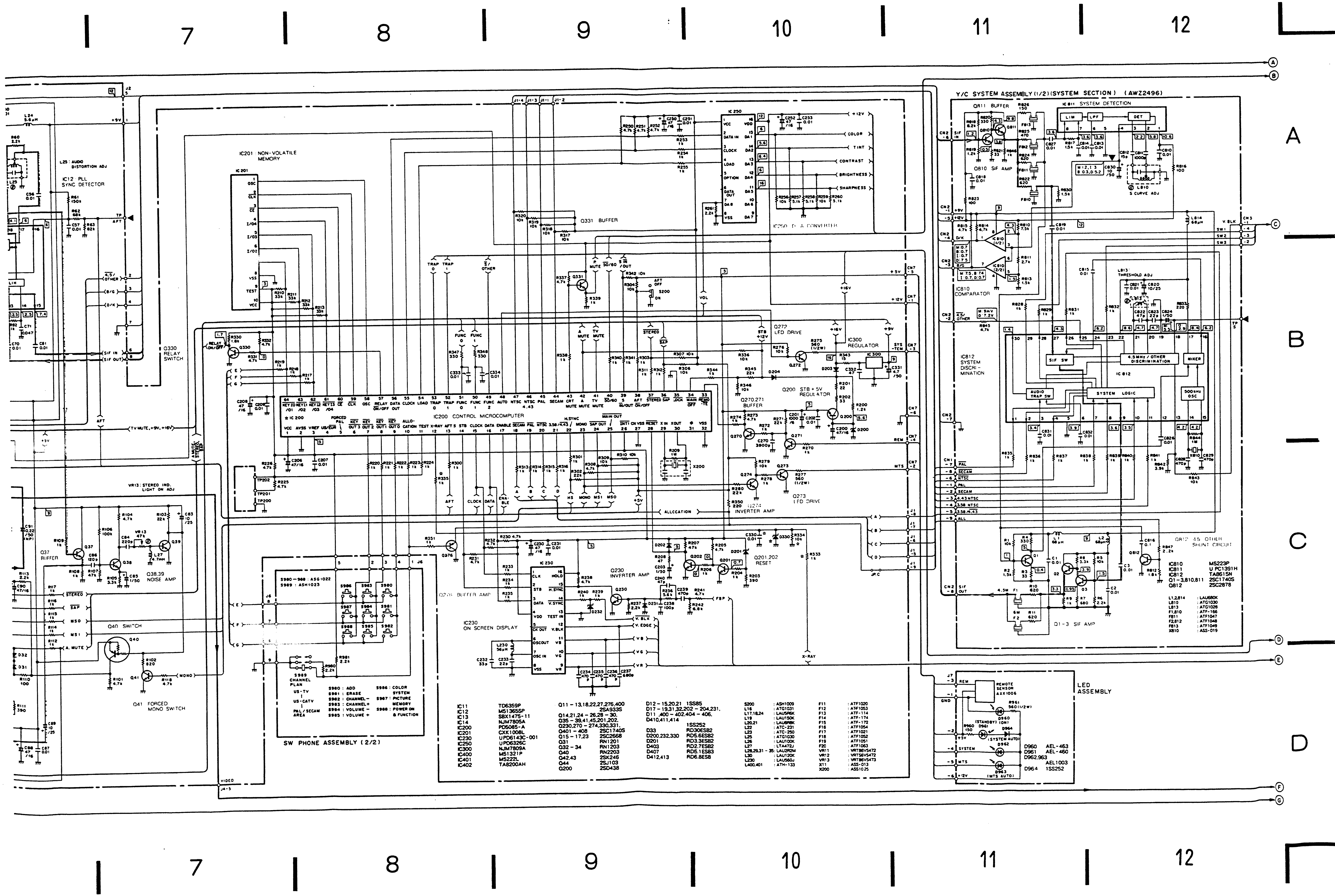
7. SWITCHES : (The underlined indicates the switch position)
POWER SWITCH ASSEMBLY
S950 : MAIN POWER ON — OFF

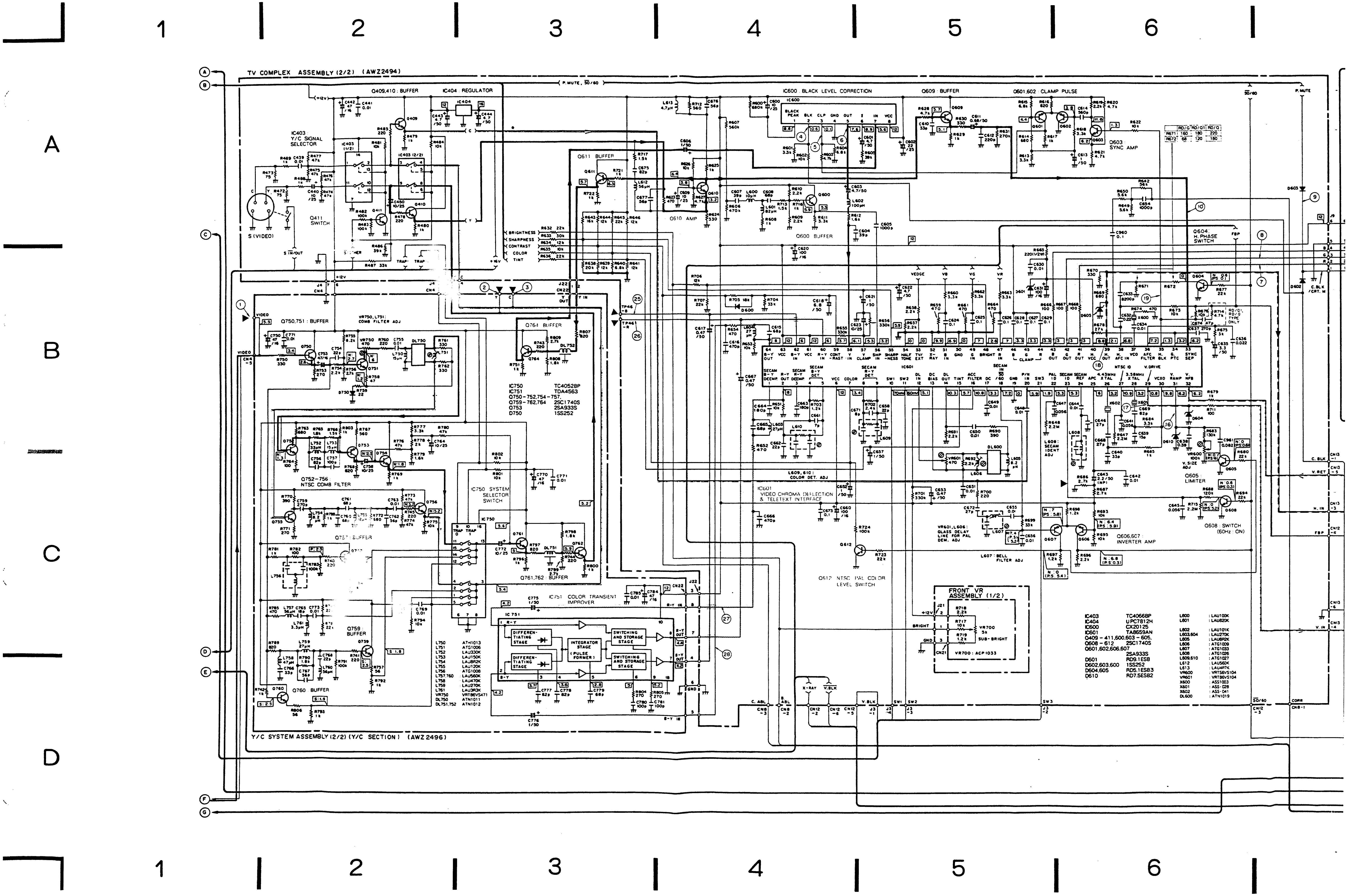
SW, PHONE ASSEMBLY
S980 : ADD
S981 : ERASE
S982 : CHANNEL −
S983 : CHANNEL +
S984 : VOLUME −
S985 : VOLUME +
S986 : COLOR SYSTEM
S987 : PICTURE MEMORY
S988 : POWER ON & FUNCTION
S989 : CHANNEL PLAN
US-TV — US-CATV — PAL/SECAM AREA

TV COMPLEX ASSEMBLY
S200 : AFT ON — OFF

OUTSIDE OF P.C. BOARDS
S1 : VOLTAGE SELECTOR 110V − 127V/220V − 240V


A
B
C
D
TV COMPLEX ASSEMBLY (1/2) (AWZ2494)
ANTENNA VHF/UHF 75Ω
TV FRONT END AXF1022
Q11-13 SWITCH
IC11 PRESCALER & PLL IC
IC14 REGULATOR
Q14 PLL CHARGE PUMP
Q17 SIF AMP
Q18 DC AMP
Q15,16 PIF AMP
Q23 PIF AMP
Q32-36 SYSTEM SWITCH
Q42-44 TRAP SWITCH
Q21,22,45 BUFFER
Q24,25 TIME CONSTANT SWITCH
Q26 SWITCH
Q27,28 HS DET
Q29,30 BUFFER
Q31 TV VIDEO SIGNAL MUTING
IC12 PLL SYNC DETECTOR
L25 : AUDIO DISTORTION ADJ
IC400 INPUT SELECTOR
Q400 VCR VIDEO SIGNAL MUTING
Q401 BUFFER
IC401 VOLUME CONTROL
Q406,407 DRIVE
IC402 POWER AMP
Q408 POWER MUTING
Q402-405 MUTING
SW PHONE ASSEMBLY (1/2)
PHONES
SPEAKERS
IC13 MPX MODULE
RV03,06 : SEPARATION ADJ
Q37 BUFFER
Q40 SWITCH
VDP INPUT
VIDEO INPUT
MONITOR /REC OUTPUT
AUDIO OUTPUT
VIDEO
AUDIO
L
R


7
8
9
10
11
12
A
B
C
D
Y/C SYSTEM ASSEMBLY (1/2) (SYSTEM SECTION) (AWZ2496)
IC201 NON-VOLATILE MEMORY
IC200 CONTROL MICROCOMPUTER
IC250 D/A CONVERTER
IC230 ON SCREEN DISPLAY
IC300 REGULATOR
Q331 BUFFER
Q330 RELAY SWITCH
Q272 LED DRIVE
Q270,271 BUFFER
Q200 STB +5V REGULATOR
Q274 INVERTER AMP
Q273 LED DRIVE
Q276 BUFFER AMP
Q230 INVERTER AMP
Q201,202 RESET
IC12 PLL SYNC DETECTOR
L25: AUDIO DISTORTION ADJ
VR13: STEREO IND. LIGHT ON ADJ
Q37 BUFFER
Q38,39 NOISE AMP
Q40 SWITCH
Q41 FORCED MONO SWITCH
Q811 BUFFER
Q810 SIF AMP
IC811 SYSTEM DETECTION
L810 S CURVE ADJ
IC810 COMPARATOR
L813: THRESHOLD ADJ
IC812 SYSTEM DISCRIMINATION
SIF SW
4.5MHz / OTHER DISCRIMINATION
MIXER
AUDIO TRAP SW
SYSTEM LOGIC
500kHz OSC
Q812 4.5 OTHER SHUNT CIRCUIT
Q1-3 SIF AMP
LED ASSEMBLY
REMOTE SENSOR AXX1006
(STANDBY) D961
D960 (ON)
D964 (SYSTEM AUTO)
D962
D963 (MTS AUTO)
COLOR
TINT
CONTRAST
BRIGHTNESS
SHARPNESS
+12V
+5V
+16V
+9V
SW PHONE ASSEMBLY (2/2)
S980-988 : ASG1022
S989 : ASH1023
S989 CHANNEL PLAN
US-TV
US-CATV
PAL / SECAM AREA
S980 : ADD
S981 : ERASE
S982 : CHANNEL−
S983 : CHANNEL+
S984 : VOLUME −
S985 : VOLUME +
S986 : COLOR SYSTEM
S987 : PICTURE MEMORY
S988 : POWER ON & FUNCTION
IC11 TD6359P
IC12 M51365SP
IC13 SBX1475-11
IC14 NJM7805A
IC200 PD5085-A
IC201 CXK1008L
IC230 UPD6143C-001
IC250 UPD6326C
IC300 NJM7809A
IC400 M51321P
IC401 M5222L
IC402 TA8200AH
Q11 − 13,18,22,27,276,400 2SA933S
Q14,21,24 − 26,28 − 30.
Q35 − 39,41,45,201,202.
Q230,270 − 274,330,331.
Q401 − 408 2SC1740S
Q15 − 17,23 2SC2668
Q31 RN1201
Q32 − 34 RN1203
Q40 RN2203
Q42,43 2SK246
Q44 2SJ103
Q200 2SD438
D12 − 15,20,21 1SS85
D17 − 19,31,32,202 − 204,231.
D11 ,400 − 402,404 − 406.
D410,411,414 1SS252
D33 RD30ESB2
D200,232,330 RD5.6ESB2
D201 RD3.3ESB2
D403 RD2.7ESB2
D407 RD5.1ESB3
D412,413 RD6.8ESB
S200 : ASH1009
L16 : ATG1031
L17,18,24 : LAU5R6K
L19 : LAU150K
L20,21 : LAU6R8K
L22 : ATC-231
L23 : ATC-250
L25 : ATG1030
L26 : LAU100K
L27 : LTA472J
L28,29,31 - 35: LAU2R2M
L30 : LAU120K
L230 : LAU560J
L400,401 : ATH-133
F11 : ATF1020
F12 : ATF1053
F13 : ATF-114
F14 : ATF-174
F15 : ATF-172
F16 : ATF1054
F17 : ATF1021
F18 : ATF1052
F19 : ATF1051
F20 : ATF1063
VR11 : VRTB6VS472
VR12 : VRTS6VS472
VR13 : VRTB6VS473
X11 : ASS-013
X200 : ASS1025
IC810 M5223P
IC811 U PC1391H
IC812 TA8615N
Q1−3,810,811 2SC1740S
Q812 2SC2878
L1,2,814 : LAU680K
L810 : ATG1030
L813 : ATG1028
F1,810 : ATF-166
F811 : ATF1047
F2,812 : ATF1048
F813 : ATF1049
X810 : ASS-019
D960 AEL-463
D961 AEL-460
D962,963 AEL1003
D964 1SS252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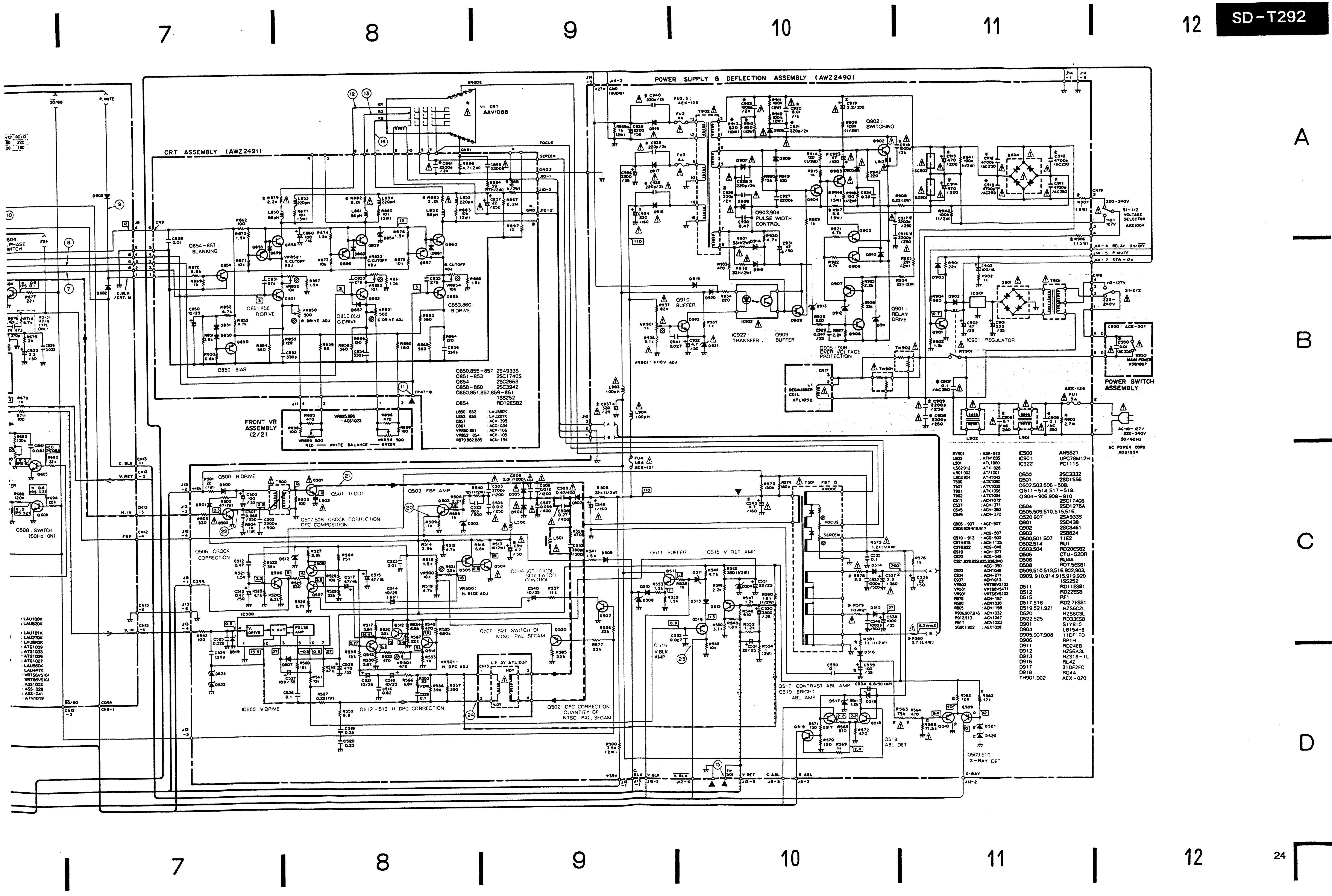
TV COMPLEX ASSEMBLY (2/2) (AWZ2494)
Y/C SYSTEM ASSEMBLY (2/2) (Y/C SECTION) (AWZ 2496)
P. MUTE, 50/60
Q409,410 : BUFFER
IC404 REGULATOR
IC403 Y/C SIGNAL SELECTOR
Q411 SWITCH
S (VIDEO)
S IN/OUT
BRIGHTNESS
SHARPNESS
CONTRAST
COLOR
TINT
Q611 BUFFER
Q610 AMP
Q600 BUFFER
IC600 BLACK LEVEL CORRECTION
BLACK PEAK
BLK CLP
GND
OUT
IN
VCC
Q609 : BUFFER
Q601,602 CLAMP PULSE
Q603 SYNC AMP
Q604 H. PHASE SWITCH
	RD/G	RD/Q1	RD/Q
R671	160	180	220
R672	68	120	180
Q750,751 : BUFFER
VR750, L751 : COMB FILTER ADJ
Q764 BUFFER
Q752-756 NTSC COMB FILTER
Q757 BUFFER
IC750 SYSTEM SELECTOR SWITCH
Q761,762 BUFFER
Q759 BUFFER
Q760 BUFFER
IC751 COLOR TRANSIENT IMPROVER
DIFFERENTIATING STAGE
INTEGRATOR STAGE (PULSE FORMER)
SWITCHING AND STORAGE STAGE
IC750 TC4052BP
IC751 TDA4563
Q750-752,754-757, Q759-762,764 2SC1740S
Q753 2SA933S
D750 1SS252
L750 ATH1013
L751 ATG1006
L752 LAU330K
L753 LAU150K
L754 LAU8R2K
L755 LAU120K
L756 ATG1008
L757,760 LAU560K
L758 LAU470K
L759 LAU270K
L761 LAU3R3K
VR750 VRTB6VS471
DL750 ATN1011
DL751,752 ATN1012
IC601 VIDEO CHROMA DEFLECTION & TELETEXT INTERFACE
L609, 610 : COLOR DET. ADJ
VR601, L606 : GLASS DELAY LINE FOR PAL DEM. ADJ
L607 : BELL FILTER ADJ
L608 : SECAM IDENT ADJ
Q612 NTSC PAL COLOR LEVEL SWITCH
Q606,607 INVERTER AMP
Q605 LIMITER
Q608 : SWITCH (60Hz : ON)
V. SIZE ADJ
FRONT VR ASSEMBLY (1/2)
BRIGHT
SUB-BRIGHT
VR700 : ACP1033
IC403 TC4066BP
IC404 UPC7812H
IC600 CX20125
IC601 TA8659AN
Q409 - 411,600,603 - 605, Q608 - 612 2SC1740S
Q601,602,606,607 2SA933S
D601 RD9.1ESB
D602,603,600 1SS252
D604,605 RD5.1ESB3
D610 RD7.5ESB2
L600 : LAU100K
L601 : LAU820K
L602 : LAU101K
L603,604 : LAU270K
L605 : LAU8R2K
L606 : ATG1009
L607 : ATG1033
L608 : ATG1026
L609,610 : ATG1027
L612 : LAU560K
L613 : LAU4R7K
VR600 : VRTS6VS104
VR601 : VRTB6VS104
X600 : ASS1003
X601 : ASS-028
X602 : ASS-041
DL600 : ATN1019
C. ABL
X-RAY
V. BLK
SW1
SW2
SW3
50/60
CORR
C. BLK
V. RET
H. IN
FBP
V. IN
C. BLK /CRT. M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CRT ASSEMBLY (AWZ2491)
POWER SUPPLY & DEFLECTION ASSEMBLY (AWZ2490)
FRONT VR ASSEMBLY (2/2)
POWER SWITCH ASSEMBLY
V1 CRT AAV1088
ANODE
FOCUS
SCREEN
Q854-857 BLANKING
Q851.858 R.DRIVE
Q852.859 G.DRIVE
Q853.860 B.DRIVE
Q850 : BIAS
VR852 R.CUTOFF ADJ
VR853 G.CUTOFF ADJ
VR854 B.CUTOFF ADJ
VR850 R.DRIVE ADJ
VR851 G.DRIVE ADJ
RED WHITE BALANCE GREEN
Q850.855-857 2SA933S
Q851-853 2SC1740S
Q854 2SC2668
Q858-860 2SC3942
D850.851.857.859-861 1SS252
D854 RD12ESB2
L850 852 : LAU560K
L853 855 : LAU221K
C857 : ACH-395
C861 : ACG-034
VR850.851 : ACP-106
VR852 854 : ACP-105
R879.882.885 ACN-194
Q902 : SWITCHING
Q903.904 : PULSE WIDTH CONTROL
Q910 BUFFER
Q909 BUFFER
IC922 TRANSFER
Q905-908 OVER VOLTAGE PROTECTION
Q901 : RELAY DRIVE
IC901 REGULATOR
VR901 : +110V ADJ
L1 DEGAUSSER COIL ATL1052
S1-1/2 VOLTAGE SELECTOR AKX1004
S950 MAIN POWER ASG1007
AC POWER CORD ADG1054
AC110-127/220-240V 50/60Hz
Q500 H.DRIVE
Q501 H.OUT
Q503 FBP AMP
Q507.508 CROCK CORRECTION DPC COMPOSITION
Q506 CROCK CORRECTION
Q504.505 DIODE REGULATOR CONTROL
VR500 : H. SIZE ADJ
Q511 BUFFER
Q515 V.RET AMP
Q516 V.BLK AMP
Q520 SIZE SWITCH OF NTSC PAL SECAM
VR501 : H. DPC ADJ
IC500 : V.DRIVE
Q512-513 H.DPC CORRECTION
Q502 DPC CORRECTION QUANTITY OF NTSC PAL SECAM
Q517 CONTRAST ABL AMP
Q519 BRIGHT ABL AMP
Q518 ABL DET
Q509.510 X-RAY DET
Q608 : SWITCH (60Hz : ON)
T501 FBT
RY901 : ASR-512
L500 : ATH1035
L501 : ATL1060
L502.912 ATX-028
L901.902 ATF1001
L903.904 ATH1042
T500 : ATK1030
T501 : ATK1032
T901 : ATK1098
T902 : ATK1034
C511 : ACH1072
C537 : ACH-371
C545 : ACH-380
C549 : ACH-372
C905-907 : ACE-507
C908.909.916.917 : ACG-507
C910-913 : ACG-503
C914.915 : ACH1125
C918.922 : ACG-040
C919 : ACH-371
C920 : ACG-045
C921.928.929.935.938.940 : ACG-050
C923 : ACH1048
C934 : ACH-271
C937 : ACH1013
VR500 : VRTS6VS103
VR501 : VRTB6VS471
VR901 : VRTS6VS102
R578 : ACN-157
R580 : ACN1030
R905 : ACN-158
R906.907.916 ACN1032
R912.913 ACN1047
R917 ACN1033
SG901.902 : AEX1008
IC500 AN5521
IC901 UPC78M12H
IC922 PC111S
Q500 2SC3332
Q501 2SD1556
Q502.503.506-508. Q511-514.517-519. Q904-906.908-910 2SC1740S
Q504 2SD1276A
Q505.509.510.515.516. Q520.907 2SA933S
Q901 2SD438
Q902 2SC3461
Q903 2SB824
D500.501.507 11E2
D502.514 RU1
D503.504 RD20ESB2
D505 CTU-G2DR
D506 RU4A
D508 RD7.5ESB1
D509.510.513.516.902.903. D909.910.914.915.919.920 1SS252
D511 RD11ESB1
D512 RD22ESB
D515 RF1
D517.518 RD2.7ESB1
D519.521.921 HZS6C2L
D520 HZS6C3L
D522.525 RD33ESB
D901 S1YB10
D904 LB154-B
D905.907.908 11DF1FD
D906 RP1H
D911 RD24EB
D912 HZS6A3L
D913 HZS18-1L
D916 RL4Z
D917 31DF2FC
D918 RG4A
TH901.902 AEX-020

The waveforms at each position

Condition

- Input : Color bar VDP input
- Picture quality : STD
- No input audio signal
- AC range
- H rate (without notice)

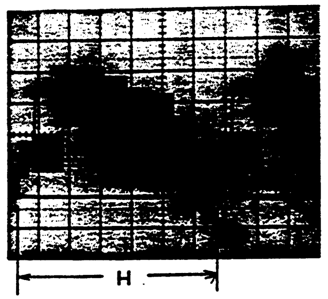
- H and V values of each waveforms are as follows at the NTSC or PAL/SECAM system.

Table 1. H and V values of each system

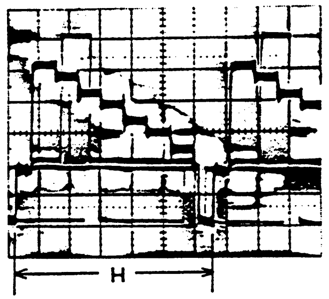
	NTSC	PAL/SECAM
V (msec) H (μsec)	16.7 (60Hz) 63.6 (15.75kHz)	20.0 (50Hz) 64.0 (15.625kHz)

- Input signal is the NTSC system, when input signal is the PAL/SECAM system, H and V values are refered to Table 1. (Photo No. ① thru ⑨)

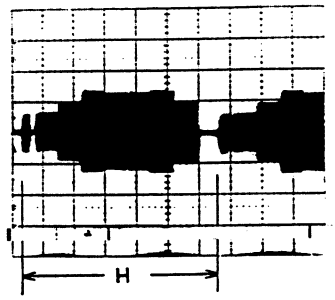
① TP-VIDEO
H : 10μsec/div
V : 500mV/div



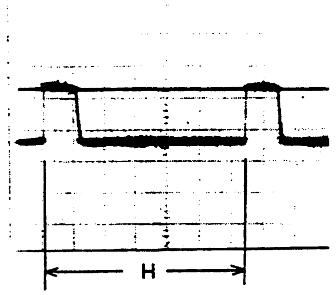
② TP Y
H : 10μsec/div
V : 200mV/div



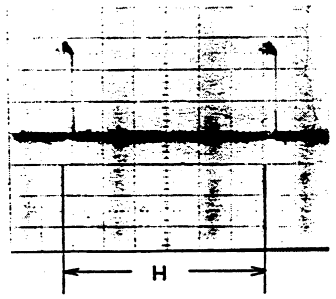
③ TP C
H : 10μsec/div
V : 100mV/div



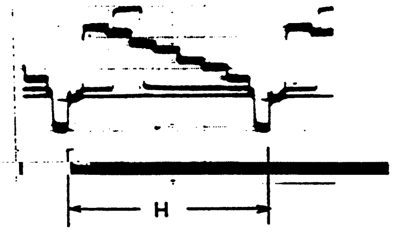
④ IC600 pin 2
H : 10μsec/div
V : 1V/div



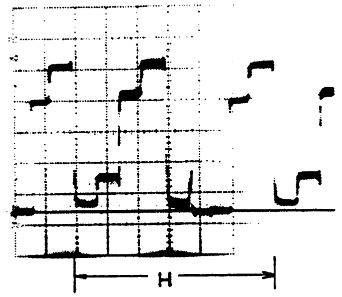
⑤ IC600 pin 3
H : 10μsec/div
V : 1V/div



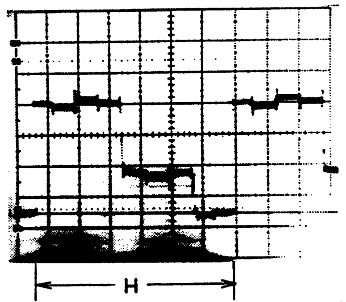
⑥ IC600 pin 5
H : 10μsec/div
V : 200mV/div



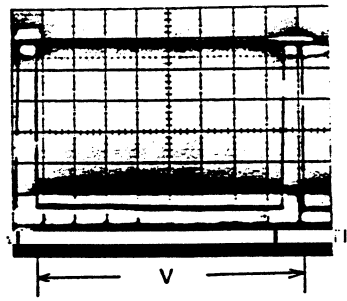
⑦ J9 pin 2 (R out)
H : 10μsec/div
V : 1V/div



⑧ J9 pin 3 (G out)
H : 10μsec/div
V : 1V/div

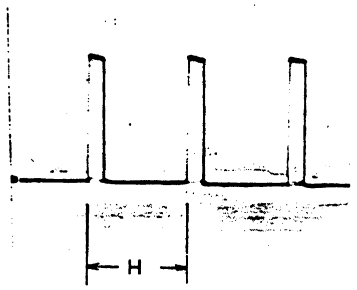


⑨ J9 pin 1 (C. BLK/MUTE)
V rate H : 2msec/div
V : 1V/div

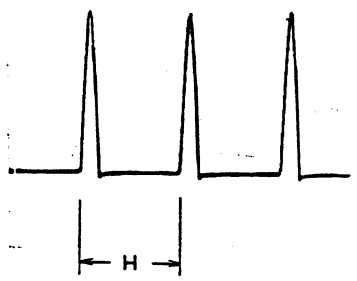


- Input signal is the NTSC system. (Photo No. ⑳ thru ㉔)

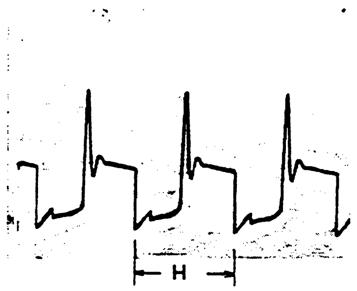
⑳ Q503 emitter
H : 20μsec/div
V : 5V/div



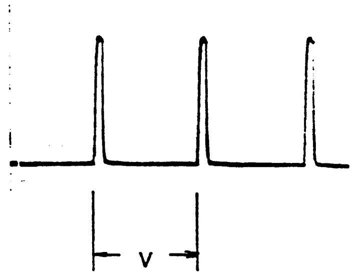
㉑ Q501 collector
H : 20μsec/div
V : 200V/div



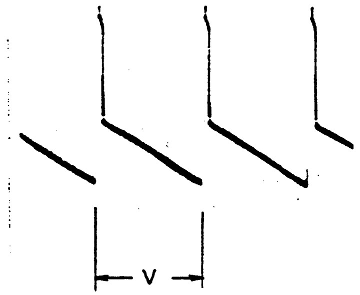
㉒ Q500 collector
H : 20μsec/div
V : 20V/div



㉓ Q516 collector
V rate H : 5msec/div
V : 5V/div

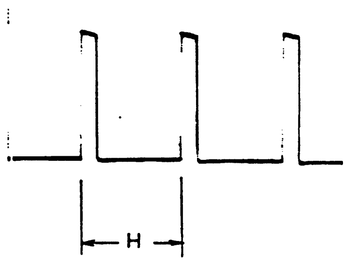


㉔ DY pin 2 (V OUT)
V rate H : 5msec/div
V : 10V/div

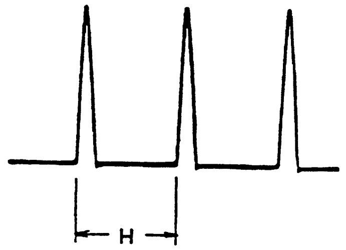


- Input signal is the PAL or SECAM system. (Photo No. ⑳ thru ㉔)

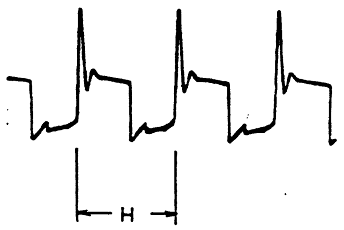
⑳ Q503 emitter
H : 20μsec/div
V : 5V/div



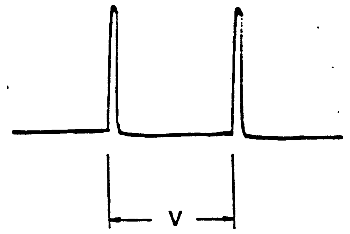
㉑ Q501 collector
H : 20μsec/div
V : 200V/div



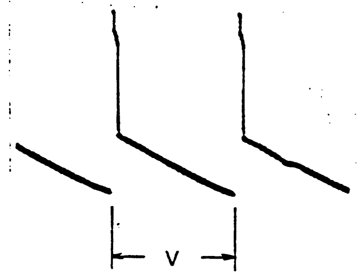
㉒ Q500 collector
H : 20μsec/div
V : 20V/div



㉓ Q516 collector
V rate H : 5msec/div
V : 5V/div

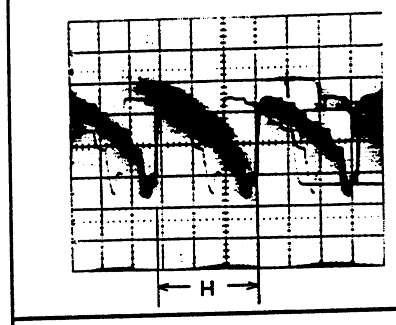


㉔ DY pin 2 (V OUT)
V rate H : 5msec/div
V : 10V/div

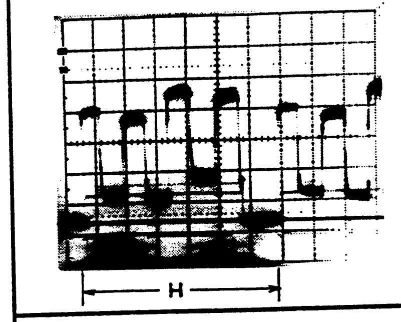


- Input signal is the NTSC system, when input signal is the PAL/SECAM system, H and V values are refered to Table 1. (Photo No. ⑩ thru ⑲)

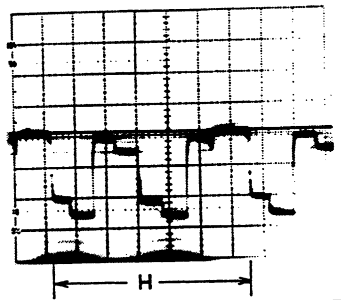
⑩ IC601 pin 33
H : 20μsec/div
V : 500mV/div



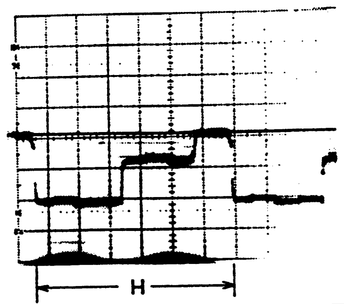
⑪ TP47 - B
H : 10μsec/div
V : 1V/div



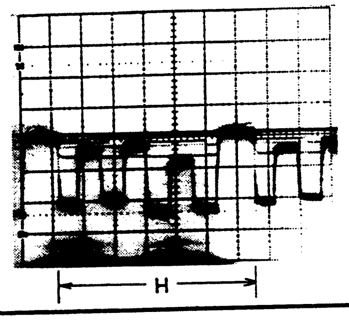
⑫ CRT socket pin 8 (Cathode R)
H : 10μsec/div
V : 50V/div



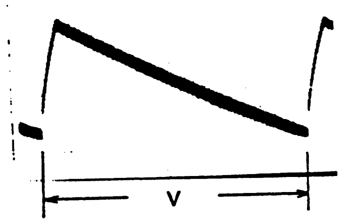
⑬ CRT socket pin 6 (Cathode G)
H : 10μsec/div
V : 50V/div



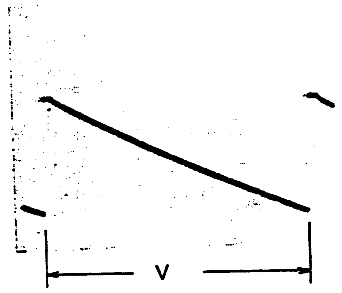
⑭ CRT socket pin 11 (Cathode B)
H : 10μsec/div
V : 50V/div



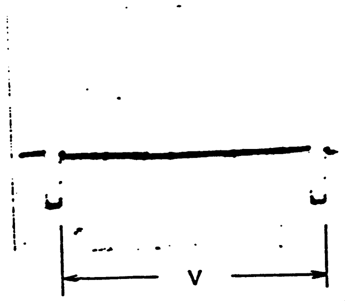
⑮ TP501 (V. RET)
V rate
H : 2msec/div
V : 500mV/div



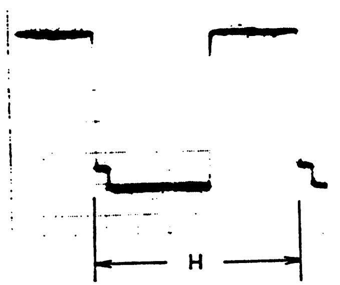
⑯ IC601 pin 31
V rate
H : 2msec/div
V : 500mV/div



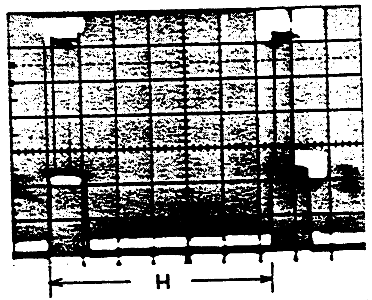
⑰ IC601 pin 29
V rate
H : 2msec/div
V : 500mV/div



⑱ IC601 pin 39
H : 10μsec/div
V : 1V/div

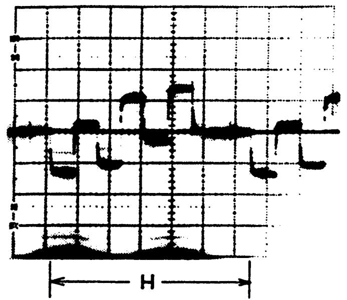


⑲ IC601 pin 35
H : 10μsec/div
V : 2V/div

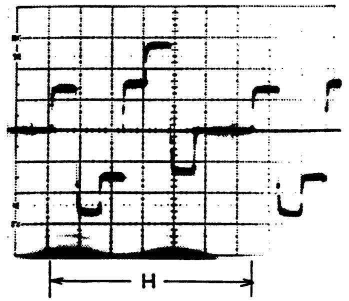


- Input signal is the NTSC system (Photo No. ㉕ thru ㉘)

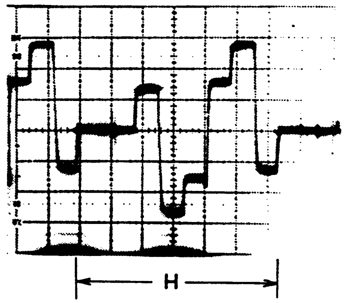
㉕ TP46 - B
H : 10μsec/div
V : 200mV/div



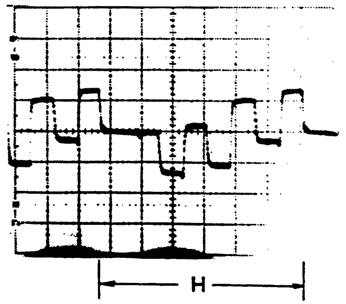
㉖ TP46 - R
H : 10μsec/div
V : 200mV/div



㉗ J22 Pin 8
H : 10μsec/div
V : 200mV/div

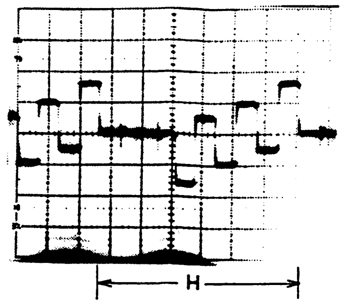


㉘ J22 Pin 5
H : 10μsec/div
V : 200mV/div

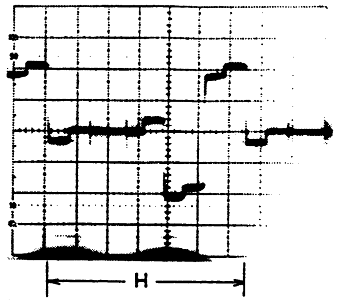


- Input signal is the PAL system (Photo No. ㉕ thru ㉘)

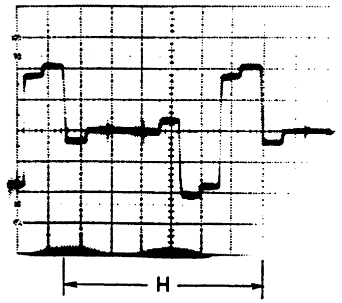
㉕ TP46 - B
H : 10μsec/div
V : 200mV/div



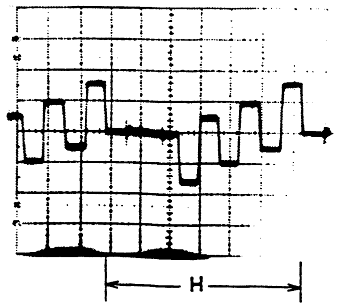
㉖ TP46 - R
H : 10μsec/div
V : 200mV/div



㉗ J22 Pin 8
H : 10μsec/div
V : 200mV/div

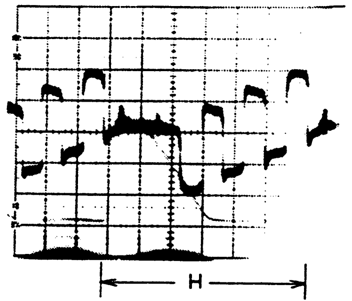


㉘ J22 Pin 5
H : 10μsec/div
V : 200mV/div

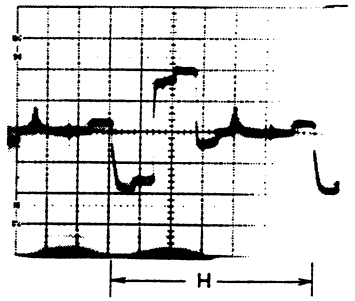


- Input signal is the SECAM system (Photo No. ㉕ thru ㉘)

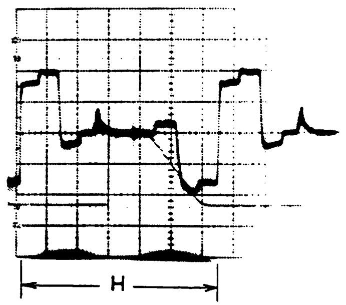
㉕ TP46 - B
H : 10μsec/div
V : 100mV/div



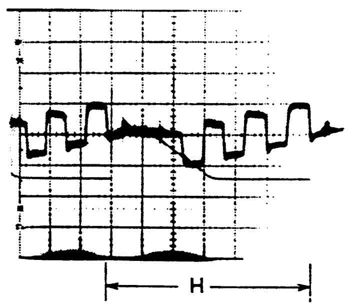
㉖ TP46 - R
H : 10μsec/div
V : 200mV/div



㉗ J22 Pin 8
H : 10μsec/div
V : 200mV/div



㉘ J22 Pin 5
H : 10μsec/div
V : 200mV/div



6.3 P. C. BOARDS CONNECTION DIAGRAM

NOTE

1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

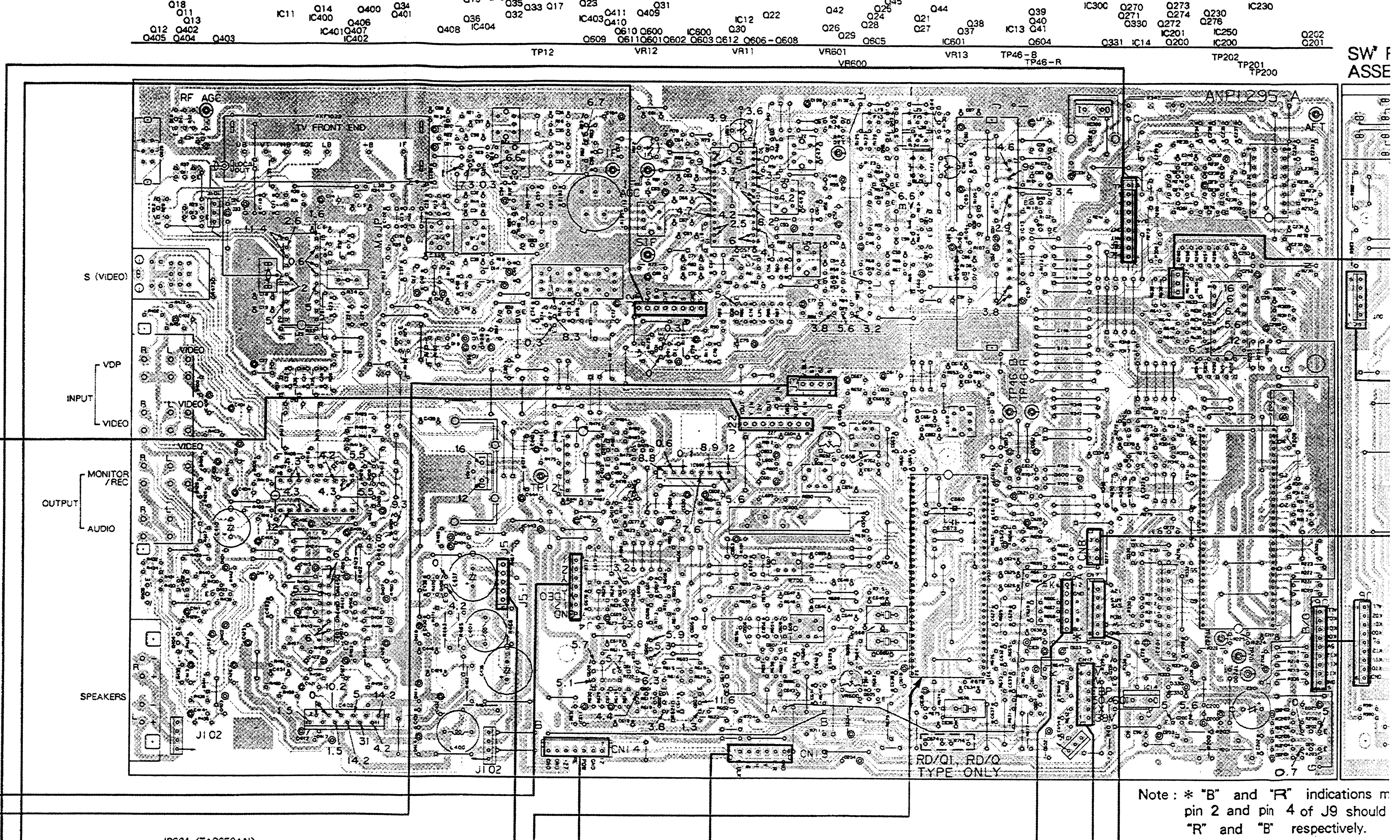
P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
Q504 E	E or E	Transistor
Q215	or	Radiator type transistor
D203	D203	Diode
R237	R237	Resistor
C513	+	Capacitor (Polarity)
C518		Capacitor (Non-polarity)

Others

P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

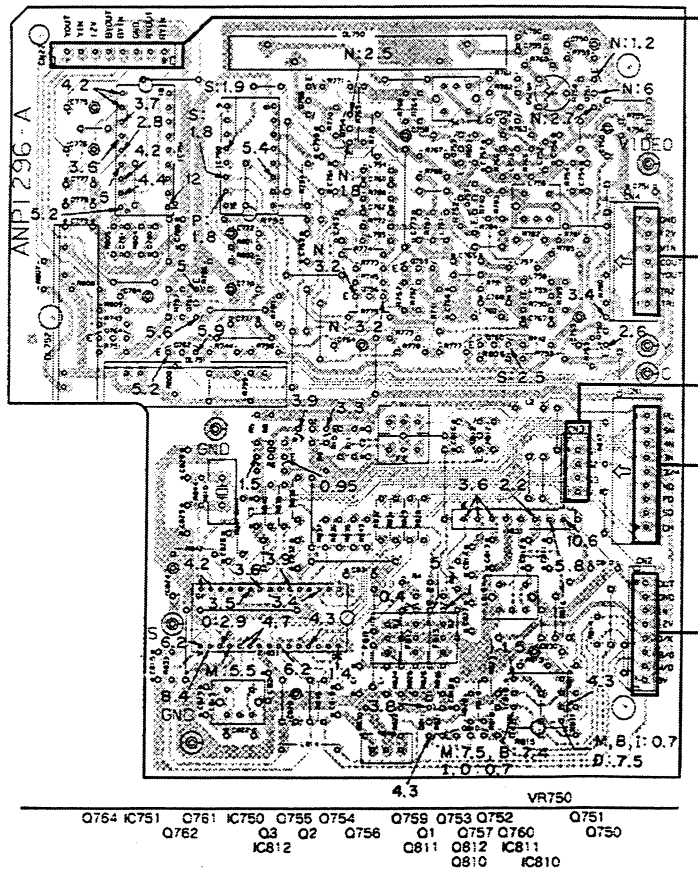
3. The capacitor terminal marked with ◎ (double circles) shows negative terminal.
4. The diode terminal marked with ◎ (double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

TV COMPLEX ASSEMBLY (AWZ2506 ; RD/Q TYPE)
(AWZ2501 : RD/Q1 TYPE)
(AWZ2494 : RD/G TYPE)


Q18
Q11
Q13
Q12 Q402
Q405 Q404
Q403
IC11
Q14
IC400
IC401 Q407
Q400
Q406
IC402
Q34
Q401
Q408
Q15 Q16
Q35
Q32
Q33 Q17
Q36
IC404
Q23
IC403
Q411
Q410
Q409
Q31
Q610 Q600
Q509 Q611 Q601 Q602
IC600
Q603 Q612
IC12
Q30
Q22
Q606 - Q608
Q42
Q26
Q29
Q43
Q45
Q25
Q24
Q28
Q605
Q21
Q27
Q44
Q38
Q37
IC601
IC13
Q39
Q40
Q41
Q604
IC300
Q270
Q271
Q330
Q331 IC14
Q273
Q274
Q272
IC201
Q200
Q230
Q276
IC250
IC200
IC230
Q202
Q201
TP12
VR12
VR11
VR601
VR600
VR13
TP46-B
TP46-R
TP202
TP201
TP200
RF AGC
TV FRONT END
ANP1295-A
AFT
S (VIDEO)
INPUT
VDP
VIDEO
OUTPUT
MONITOR /REC
AUDIO
SPEAKERS
J102
CN14
CN19
RD/Q1, RD/Q
TYPE ONLY
SW' F
ASSE

Note : * "B" and "R" indications m
pin 2 and pin 4 of J9 should
"R" and "B" respectively.

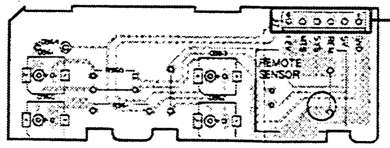
Y/C SYSTEM ASSEMBLY (AWZ2496)


ANP1296-A
N:1.2
N:2.5
N:6
S:1.9
VIDEO
GND
M:5.5
M,B,I:0.7
D:7.5
M:7.5, B:7.4
I,D:0.7
4.3
VR750
Q764 IC751
Q762
Q761 IC750
Q3
IC812
Q755 Q754
Q2
Q756
Q759 Q753 Q752
Q1
Q811
Q757 Q760
Q812
Q810
IC811
IC810
Q751
Q750

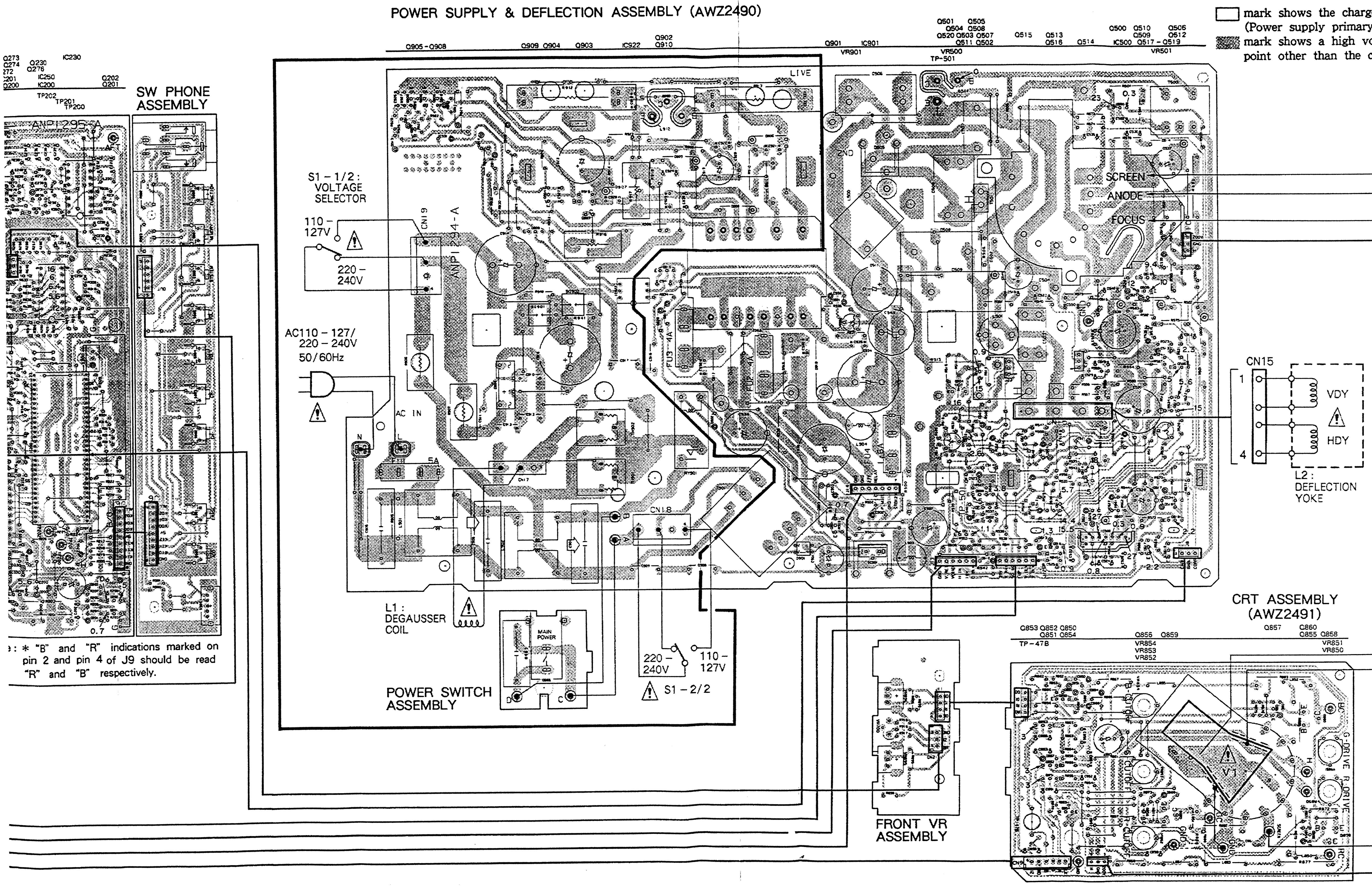
IC601 (TA8659AN)

Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts
1		15	5.7	29	0.8	43	3	57	6.3
2	8	16	10.8	30	9.8	44	3.3	58	6.1
3		17	3.3	31	6.2	45	3.3	59	3.7
4		18	7.2	32	6.2	46	3.3	60	6
5		19	0	33	6.2	47	7	61	12
6	12	20	5.9	34	3.2	48	2.6	62	6
7	3.4	21	1.9	35	1.3	49	7	63	12
8		22	6.3	36	7.2	50	0	64	8
9		23	6.3	37		51	6.9		
10	70mV	24		38	6.8	52	9.9		
11	60mV	25	6	39	2.1	53	0		
12	5.1	26	3.2	40	8.8	54	0		
13		27	10.9	41	3	55	5.9		
14	10.3	28	3.2	42	3	56	3.2		

LED ASSEMBLY


REMOTE SENSOR

▭ mark shows the charged section (Power supply primary side circuit).
▨ mark shows a high voltage generation point other than the charged section.

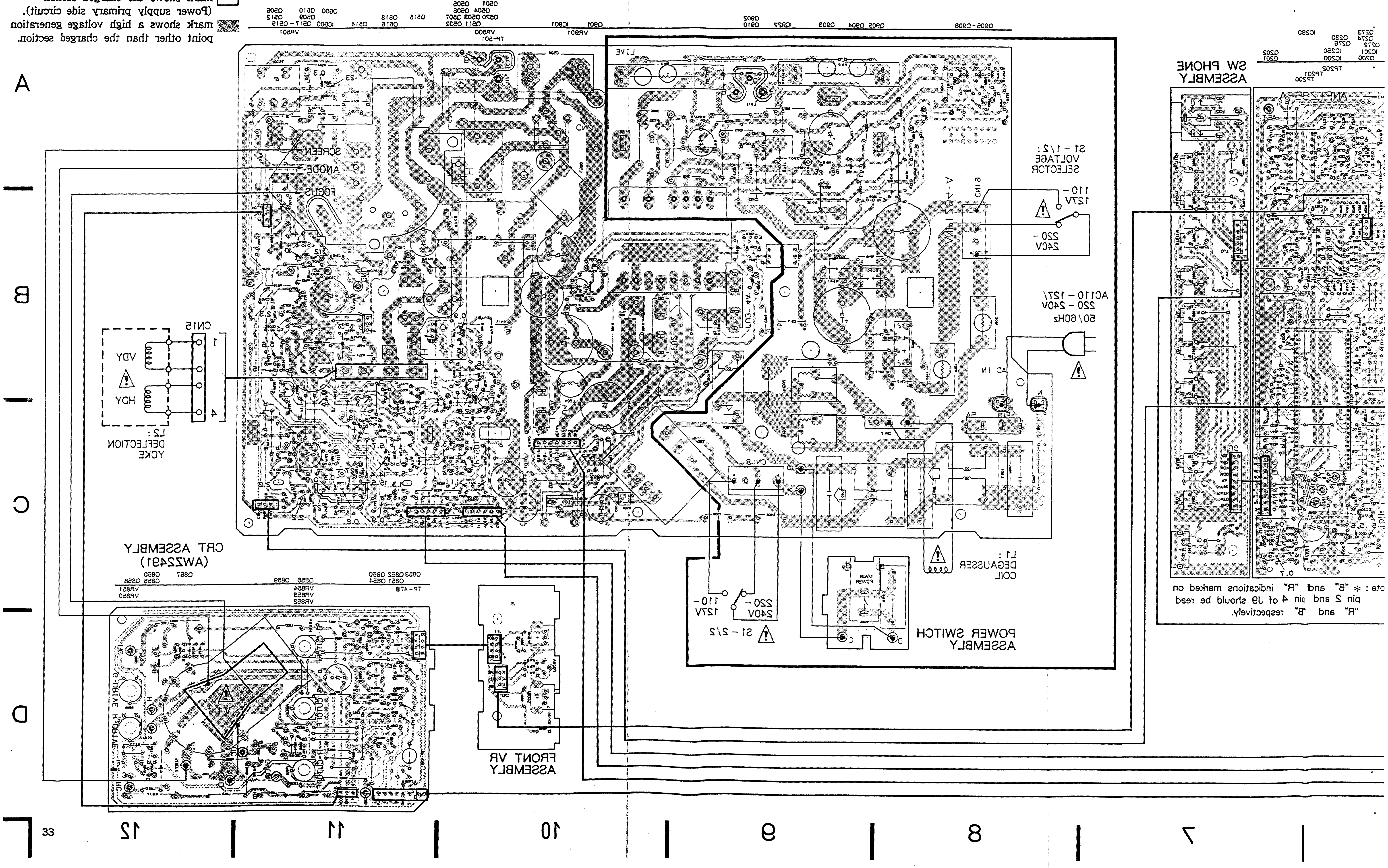

POWER SUPPLY & DEFLECTION ASSEMBLY (AWZ2490)
Q905 - Q908
Q909 Q904
Q903
IC922
Q902
Q910
Q901
IC901
VR901
Q501 Q505
Q504 Q508
Q520 Q503 Q507
Q511 Q502
VR500
TP-501
Q515
Q513
Q516
Q514
Q500 Q510
Q509
IC500 Q517 - Q519
Q506
Q512
VR501
Q273
Q274
272
Q230
Q276
IC230
201
Q200
IC250
IC200
Q202
Q201
TP202
TP201
TP200
SW PHONE
ASSEMBLY
ANP1295-A
APT
S1 - 1/2 :
VOLTAGE
SELECTOR
110 -
127V
220 -
240V
CN19
ANP1294-A
LIVE
AC110 - 127/
220 - 240V
50/60Hz
AC IN
N
L
5A
FU3 - 4A
FU2 - 4A
CN17
CN18
GND
SCREEN
ANODE
FOCUS
TP-501
CN15
1
4
VDY
HDY
L2 :
DEFLECTION
YOKE
L1 :
DEGAUSSER
COIL
MAIN
POWER
D
C
POWER SWITCH
ASSEMBLY
220 -
240V
110 -
127V
S1 - 2/2
FRONT VR
ASSEMBLY
CRT ASSEMBLY
(AWZ2491)
Q853 Q852 Q850
Q851 Q854
TP-47B
Q856 Q859
VR854
VR853
VR852
Q857
C860
Q855 Q858
VR851
VR850
G-CUTOFF
B-CUTOFF
R-CUTOFF
G-DRIVE
R-DRIVE
V1
GND
H
RC
0.7

: * "B" and "R" indications marked on pin 2 and pin 4 of J9 should be read "R" and "B" respectively.

☐ mark shows the charged section (Power supply primary side circuit).

▨ mark shows a high voltage generation point other than the charged section.

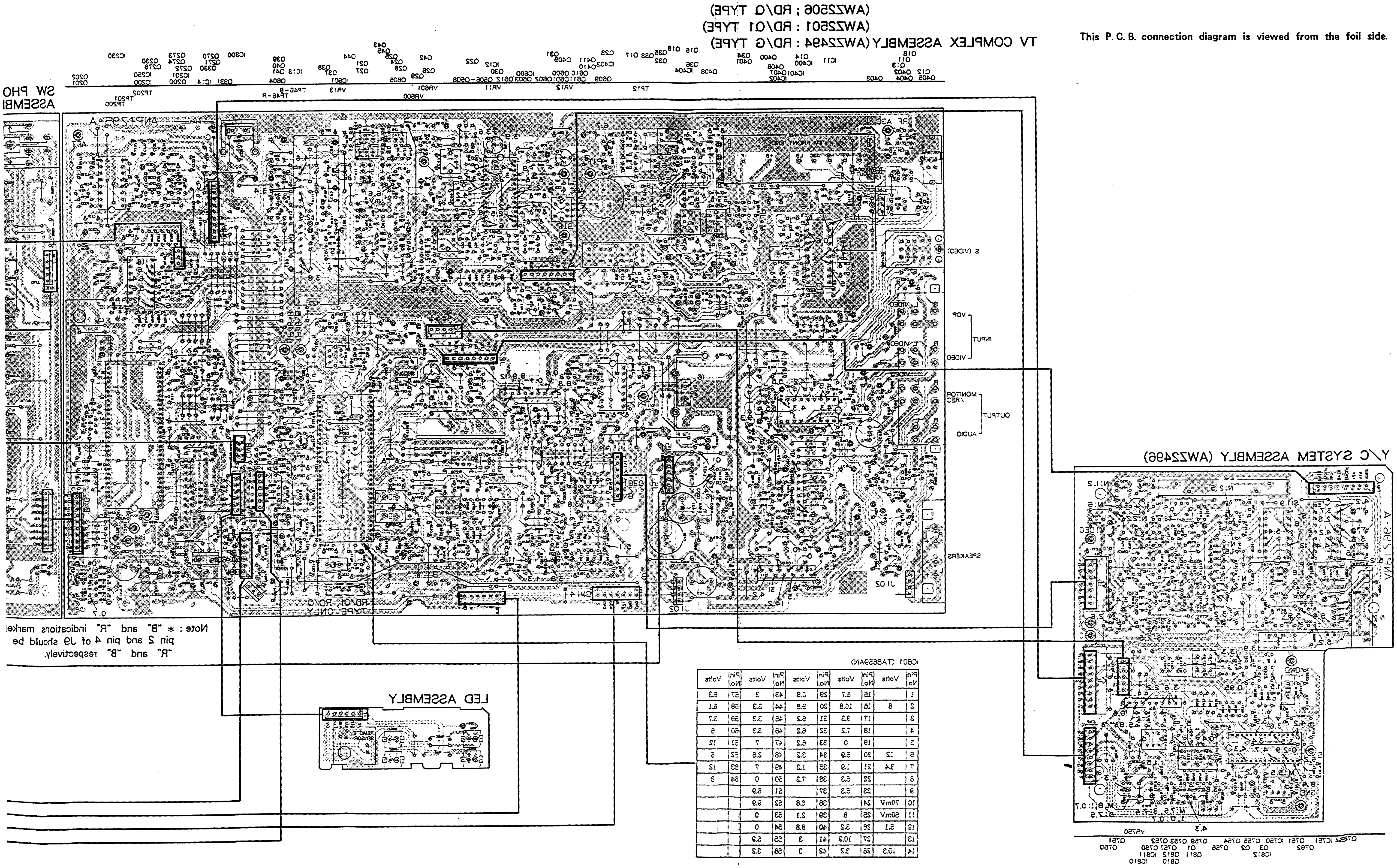
POWER SUPPLY & DEFLECTION ASSEMBLY (AWZ2490)


12
11
10
9
8
7
A
B
C
D
SCREEN
ANODE
FOCUS
CN15
VDY
HDY
L2 : DEFLECTION YOKE
CRT ASSEMBLY (AWZ2491)
FRONT VR ASSEMBLY
LIVE
S1 - 1/2 : VOLTAGE SELECTOR
110 - 127V
220 - 240V
AC110 - 127V/ 220 - 240V 50/60Hz
AC IN
CN18
L1 : DEGAUSSER COIL
S1 - 2/2
POWER SWITCH ASSEMBLY
MAIN POWER
SW PHONE ASSEMBLY
G-DRIVE
R-DRIVE
CUTOFF
TP-501
TP-478

ote : * "B" and "R" indications marked on pin 2 and pin 4 of J9 should be read "R" and "B" respectively.

This P.C.B. connection diagram is viewed from the foil side.

TV COMPLEX ASSEMBLY (AWZ2494 : RD/G TYPE)
(AWZ2501 : RD/O1 TYPE)
(AWZ2506 ; RD/O TYPE)


ANP1295-A
SW PHO
ASSEMBL
TV FRONT END
RF AGC
S (VIDEO)
INPUT
VDP
VIDEO
MONITOR /REC
OUTPUT
AUDIO
SPEAKERS
J102
CN14
CN19
RD/O1, RD/O TYPE ONLY
REMOTE SENSOR
LED ASSEMBLY
Y/C SYSTEM ASSEMBLY (AWZ2496)
ANP1296-A
GND
TP200
TP201
TP202
TP46-R
TP46-B
TP12
VR11
VR12
VR13
VR600
VR601
VR750

Note : * "B" and "R" indications marke
pin 2 and pin 4 of J9 should be
"R" and "B" respectively.

IC301 (TA8659AN)

Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts
1		15	5.7	29	0.8	43	3	57	5.3
2	3	16	10.8	30	9.8	44	3.3	58	6.1
3		17	3.3	31	6.2	45	3.3	59	3.7
4		18	7.2	32	6.2	46	3.3	60	6
5		19	0	33	6.2	47	7	61	12
6	12	20	5.9	34	3.2	48	2.6	62	5
7	3.4	21	1.9	35	1.3	49	7	63	12
8		22	5.3	36	7.2	50	0	64	8
9		23	5.3	37		51	6.9		
10	70mV	24		38	6.8	52	9.9		
11	60mV	25	6	39	2.1	53	0		
12	5.1	26	3.2	40	3.8	54	0		
13		27	10.9	41	3	55	5.9		
14	10.3	28	3.2	42	3	56	3.2		

7. ADJUSTMENTS

- As the SD-T292 can be used with NTSC,PAL and SECAM TV broadcasting formats, and with M, B, G, I, D and K TV standard systems, this section describes the adjustment procedure for each TV broadcasting format and standard systems.

This section includes :

7.1 Power supply section adjustment :
  Can be done regardless of the TV broadcasting formats and standard systems.
7.2 Deflection section and CRT periphery adjustment :
  Can be done regardless of the TV broadcasting formats and standard systems.
7.3 Video section adjustment :
  Depends on the TV broadcasting format (NTSC, PAL or SECAM).
7.4 System block adjustment :
  Can be done regardless of the TV broadcasting formats and standard systems.
7.5 Tuner section adjustment :
  Only the video trap adjustment depends on the TV standard system (M, B, G, I, D or K).
7.6 Control block adjustment :
  Can be done regardless of the TV broadcasting formats and standard systems.
7.7 Purity adjustment
7.8 Convergence adjustment
7.9 Insertion of rubber wedge

For the SD-291, perform the adjustment items which are not marked "SD-T292 only".

- Symbols in parentheses next to the adjustment position ( ) denote the relevant assembly to be adjusted.

P : POWER SUPPLY & DEFLECTION assembly
C : CRT assembly
T : TV COMPLEX assembly
Y : Y/C SYSTEM assembly
I : IC13 (Audio MPX IC SBX1475-11)

- During adjustment, unless specified, the picture quality should be set to the standard setting using the remote control unit.
  The WHITE BALANCE controls on the front panel, both VR896 (green) and VR895 (red), should be set to the center position.
- Unless specified, the signal should be input via the INPUT VDP connector.

7.1 POWER SUPPLY Section Adjustment

- This section can be adjusted regardless of the TV broadcasting formats and standard systems.

Step No.	Adjustment item	Input signal	Adjustment point	Adjustment procedure
1	110V adjustment	Monoscope	VR901 (P)	Adjust the voltage of D918 cathode side (+110V line) of the POWER SUPPLY & DEFLECTION assembly to 110V±0.5V.

7.2 Deflection Section and CRT periphery Adjustment

- These sections can be adjusted regardless of the TV broadcasting formats and standard systems.

7.2.1 Preparation

- Unless specified, the picture quality should be set to the standard setting using the remote control unit.
- Be sure to follow the adjustments procedure described in the table (7.2.2). For the purity adjustment, convergence adjustment and insertion of rubber wedge, also refer to the sectins 7.7 to 7.9.
- Set the service mirror as closely as possible so that the screen can be seen from the rear.
- When removing the anode cap, first disconnect the AC power cord from the AC outlet, then connect the CRT earth wire to a good ground as shown in Fig. 7-15. Remove the anode cap carefully.
- When replacing the CRT, deflection yoke or purity magnet, prepare as follows :

1. When replacing the CRT and the deflection yoke, remove the rubber wedge and replace it with a new one. When replacing only the deflection yoke, eliminate cleanly the adhesive material (silicone cement) which is stuck to the CRT with a knife, etc., after removing the rubber wedge.
2. Attach the new deflection yoke and the purity magnet horizontally as shown in Fig. 7-11.
3. Set the 2-polar, 4-polar and 6-polar purity magnets so that no magnetic field exists. (See Fig. 7-1.)
4. Insert temporarily the rubber wedge at the top of the deflection yoke while performing purity and convergence rough adjustment as described in 7.7 and 7.8, so that the deflection yoke is kept horizontal. (See Fig. 7-2.)
5. Demagnetize the CRT with a magnetic eraser.

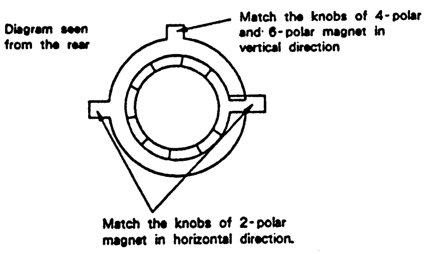


Diagram seen from the rear
Match the knobs of 4-polar and 6-polar magnet in vertical direction
Match the knobs of 2-polar magnet in horizontal direction.

Fig. 7-1 Preset of the purity magnet

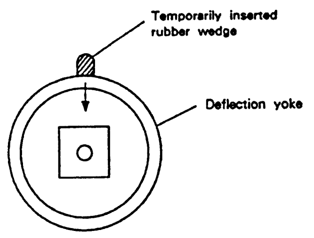


Fig. 7-2 Temporary insertion of the rubber wedge

7.2.2 Adjustments

Step No.	Adjustment item	Input signal	Adjustment point	Adjustment procedure
1	White balance rough adjustment	Perform rough adjustment as described in step 10.		
2	Focus adjustment	Monoscope signal	Focus VR (P)	Adjust so that the focus ring is as sharp as possible.
3	Purity rough adjustment	Perform rough adjustment of purity as described in 7.7, if purity is incorrect due to the replacement of the CRT, deflection yoke or purity magnet, for example.		
4	Vertical size adjustment	Monoscope signal	VR600 (T)	Adjust so that the average of top and bottom is 89%.
5	Horizontal DPC adjustment	Cross hatch	VR501 (P)	Adjust so that the distortion of the vertical lines at the left and right edges of the screen is the minimum.
6	Horizontal size adjustment	Monoscope signal	VR500 (P)	Adjust so that the average of left and right is 89%.
7	Purity adjustment	Perform purity adjustment as described in 7.7 if purity is incorrect due to the replacement of the CRT, deflection yoke or purity magnet, for example.		
8	Convergence adjustment	Perform convergence adjustment as described in 7.8, if convergence is incorrect due to the replacement of the CRT, deflection yoke or purity magnet, for example.		
9	Repeat steps 7 to 8 until the optimum picture is obtained. Insert the rubber wedge as described in 7.9.			
10	White balance adjustment	Black burst signal	Screen VR (P) Cutoff VR (C) VR852 (Red) VR853 (Green) VR854 (Blue) Drive VR (C) VR850 (Red) VR851 (Green)	Set the screen VRs and cutoff VRs to the minimum position.
				Set the drive VRs to the center position.
				Connect TP501 in the POWER SUPPLY & DEFLECTION assembly to GND so that the single horizontal line appears.
				Adjust screen VR so that the horizontal line appears slightly.
				Adjust cutoff VRs for the colors other than the displayed one, so that the line becomes white.
				Disconnect TP501 from GND.
		White 100% signal		Re-adjust white with drive VRs.
11	PIONEER Picture Quality Standard check	For the sharpness, brightness, contrast, color and tint, perform the adjustment described in 7.6.1 only when the optimum screen quality is not obtained.		

7.3 Video Section Adjustment

- As the adjustment procedure depends on the TV broadcasting format (NTSC, PAL or SECAM), follow the procedure corresponding to the format used.

7.3.1 For the NTSC mode

- When the input signal complies with the NTSC mode (subcarrier ; 3.58MHz), perform adjustment as described below.

Step No.	Adjustment item	Input signal	Adjustment point	Adjustment procedure
1	Adjustment of comb filter	Color bar	VR750 (Y)	Adjust so that color signal elements at TP Y in the Y/C SYSTEM assembly are reduced as much as possible.
2			L751 (Y)	
3	Repeat steps 1 and 2 until the best possible picture is obtained.			

7.3.2 For the PAL mode (SD−T292 only)

- When the input signal complies with the PAL mode, perform adjustment as described below.
- The following adjustment requires the DEM pattern.
- If the following adjustment is not correctly performed, colors change per each scanning line, and this can be judged only by using the DEM pattern.

Step No.	Adjustment item	Input signal	Adjustment point	Adjustment procedure
1	Adjustment of glass delay line for PAL demodulator.	PAL DEM pattern	—	Set oscilloscope as follows : H = 2mS/div ; V = 100mV/div. Connect it to TP46-R of TV COMPLEX assembly.
2			L606 (T)	Adjust so that the waveform of the measuring area 1 in Fig. 7-4 (Fig. 7-5 a) appears as shown in Fig. 7-5 b.
3			VR601 (T)	Adjust so that the waveform of the measuring area 2 in Fig. 7-4 appears as shown in Fig. 7-5 c.
4	Repeat steps 2 and 3 until the optimum picture is obtained. (Adjust so that the measuring area 1 is set below 50mVp-p, and the measuring area 2 is set below 180mVp-p.)			

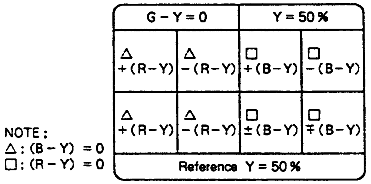

G − Y = 0
Y = 50 %
△ +(R−Y)
△ −(R−Y)
□ +(B−Y)
□ −(B−Y)
△ +(R−Y)
△ −(R−Y)
□ ±(B−Y)
□ ∓(B−Y)
Reference Y = 50 %
NOTE :
△ : (B − Y) = 0
□ : (R − Y) = 0

Fig. 7-3 DEM pattern

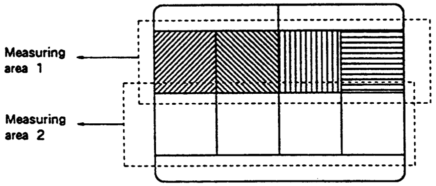

Measuring area 1
Measuring area 2

Fig. 7-4 Measuring area

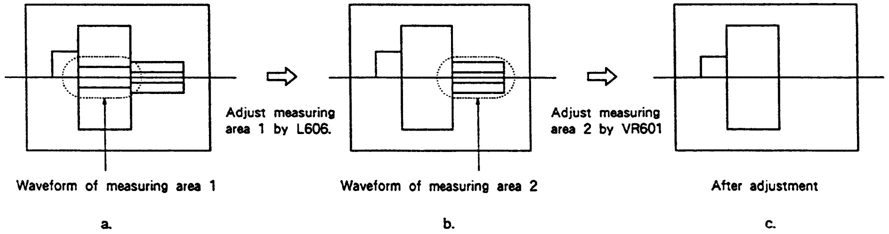

Adjust measuring area 1 by L606.
Adjust measuring area 2 by VR601
Waveform of measuring area 1
Waveform of measuring area 2
After adjustment
a.
b.
c.

Fig. 7-5 Oscilloscope screen

7.3.3 For the SECAM mode (SD−T292 only)

- When the input signal complies with the SECAM mode, perform adjustment as described below.

Step No.	Adjustment item	Input signal	Adjustment point	Adjustment procedure
1	SECAM identity adjustment	SECAM color bar	L608 (T)	Adjust so that the DC voltage at pin 23 of IC601 in the TV COMPLEX assembly is maximum.
2	Detection coil adjustment	Black signal (including SECAM color carrier)	L609 (T) : TP46 − R L610 (T) : TP46 − B	Adjust so that waveform appears as shown in Fig. 7-6 b at TP46-R and TP46-B in the TV COMPLEX assembly.
3			L607 (T)	Adjust so that the waveform appears as shown in Fig. 7-6 c at TP46-R and TP46-B in the TV COMPLEX assembly.
4	Repeat steps 2 to 3 until the optimum picture is obtained. Check to see that the color bars are displayed correctly on the screen after adjustment.			

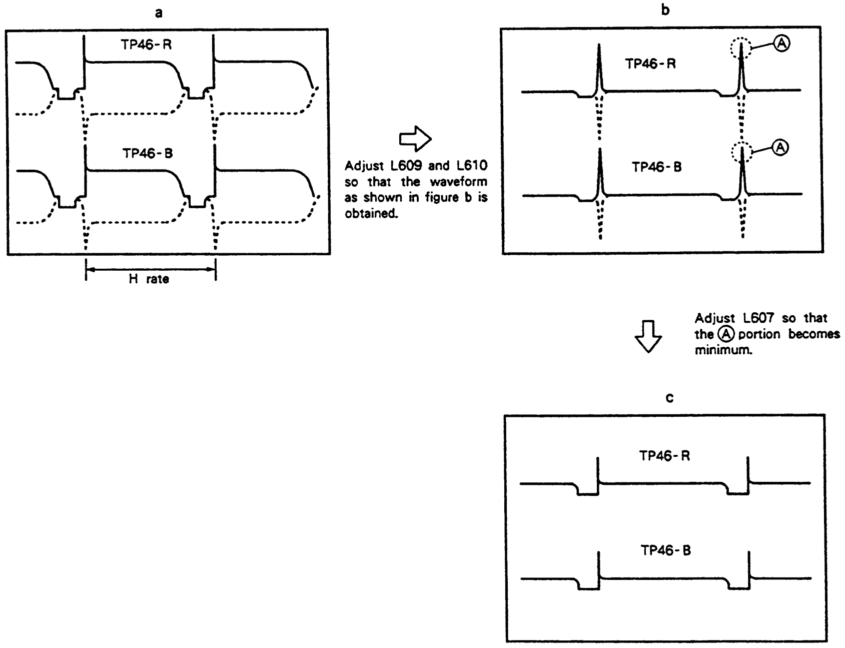

a
TP46-R
TP46-B
H rate
Adjust L609 and L610 so that the waveform as shown in figure b is obtained.
b
TP46-R
TP46-B
Ⓐ
Ⓐ
Adjust L607 so that the Ⓐ portion becomes minimum.
c
TP46-R
TP46-B

Fig. 7-6 SECAM detection coil adjustment

7.4 System Block Adjustment (SD-T292 only)

- The system block should be adjusted prior to the tuner section.
- The system block can be adjusted regardless of the TV broadcasting formats and standard systems.
- The system block should be adjusted only when the TV standard system (M, B, G, I, D or K) has not been correctly set after repair work, etc.
- Test points (TP connectors) are all included in the Y/C SYSTEM assembly.

● Preparation prior to adjustment

1. Remove the Y/C SYSTEM assembly from the TV COMPLEX assembly together with the connectors.
2. Apply DC +9V to pin CN2-1 (9V), DC +12V to pin CN2-5 (12V), and DC +12V to pin CN3-1 (V.P).

7.4.1 M mode switching section

- Input carrier (not modulated, 4.75MHz, 90dBμ) from pin CN2-6.

Step No.	Adjustment Item	Adjustment Point	Adjustment Procedure
1	Threshold	L813 (Y)	Adjust the voltage of TP S to 4.5V ± 0.1V.

7.4.2 B, G, I, D, K modes switching section

- Input carrier (not modulated, 6.0MHz, 90dBμ) from pin CN2-6.

Step No.	Adjustment Item	Adjustment Point	Adjustment Procedure
1	S curve adjustment	L810 (Y)	Adjust the voltage at pin 4 of IC811 to 3V ± 0.1V.

7.5 Tuner Section Adjustment

- In the tuner section adjustment, only the video trap adjustment differs according to the TV standard system (M, B, G, I, D or K).
  For the SD-291, perform adjustment in the M system.
- Set the CHANNEL PLAN switch (S989) to the position corresponding to the area the set is used.
- During adjustment, set the AFT switch (S200) at the rear to OFF.
- Test signal to be used : Use basically 9ch signal for VHF and 40ch signal for UHF principal, unless otherwise specified. (If these channels are not available, select any other channels.)

Video
V (1) : fv = Color bar, 60dBμ
V (2) : fv = Color bar, 25dBμ
Audio (monaural)
S (1) : f_A = 1kHz, 100 % MOD, 54dBμ
Audio (stereo)
S (2) : f_A = 300Hz, 30 % MOD, 54dBμ, Lch only (or Rch only)
S (3) : f_A = 5kHz, 30 % MOD, 54dBμ, Lch only (or Rch only)
S (4) : f_A = 1kHz, 100 % MOD, 19dBμ

- Make connections as indicated in Fig. 7-13.
- Perform adjustment (especially the trap adjustment, described in 7.5.2) in the M system as much as possible. (If adjustment is performed in the system other than M, the picture received in the M system or in another system may not be displayed correctly.) (SD-T292 only)
- Refer to the Fig. 7-16, which shows the frequency band (RF signal) with fp (video carrier) of zero in each TV standard system. (SD-T292 only)

7.5.1 Video Section Adjustment

Step No.	Adjustment Item	Input Signal		Adjustment Point	Adjustment Procedure
		Video	Audio		
1	VCO rougth adjustment	V (1)	S (1)	L23 (T)	Produce video output.
2	Trap adjustment	Refer to 7.5.2 as the trap adjustment depends on the TV standard systems (M. B. G. I. D or K).			
3	VCO adjustment	V (1)	S (1)	–	Connect TP IF AGC to ground position and measure DC voltage at TP APC DET.
4				L23 (T)	Disconnect TP IF AGC from ground. Adjust so that the difference in DC voltage at TP APC DET between the one measured at step 3 and the measured at step 4 is 0V ± 10mV.
5	AFT adjustment			L22 (T)	Adjust DC voltage at TP AFT to 2.5V ± 100mV.
6	AGC adjustment			VR12 (T)	Adjust DC voltage at TP RF AGC to 6.5V $^{+0.5}_{-0.3}$ V.
7	Video level adjustment			VR11 (T)	Adjust picture output voltage at TP12 to 2.2Vp-p ± 10 %.

7.5.2 Trap adjustment

- Followings are the trap adjustment procedures for each TV standard systems (M, B, G, I, D and K).
- Test points (TP) are all included in the TV COMPLEX assembly.

● For M mode

Step No.	Adjustment Item	Input Signal		Adjustment Point	Adjustment Procedure
		Video	Audio		
2-1	Upper adjacent video trap adjustment	Upper adjacent channel V (1)	S (1)	F12 (T)	Reduce 32.9MHz elements at TP PIF to a minimum.
2-2	Audio trap adjustment 1	V (1)	S (1)	F18 (T)	Reduce 34.4MHz elements at TP PIF to a minimum.
2-3	Lower adjacent audio trap adjustment	Lower adjacent channel V (1)	S (1)	F19 (T)	Reduce 40.4MHz elements at TP PIF to a minimum.
2-4	Audio trap adjustment 2	V (1)	S (1)	F20 (T)	Reduce 34.4MHz elements at TP PIF to a minimum.

● For B mode (SD-T292 only)

After adjustment as described below, picture may not be displayed correctly when receiving in another system. If this happenes, perform adjustment for that system, or, for the best picture, perform adjustment for the M system.

Step No.	Adjustment Item	Input Signal		Adjustment Point	Adjustment Procedure
		Video	Audio		
2-1	Upper adjacent video trap adjustment	Upper adjacent channel V (1)	S (1)	F12 (T)	Reduce 31.9MHz elements at TP PIF to a minimum.
2-2	Audio trap adjustment 1	V (1)	S (1)	F18 (T)	Reduce 33.4MHz elements at TP PIF to a minimum.
2-3	Lower adjacent audio trap adjustment	Lower adjacent channel V (1)	S (1)	F19 (T)	Reduce 40.4MHz elements at TP PIF to a minimum.
2-4	Audio trap adjustment 2	V (1)	S (1)	F20 (T)	Reduce 33.4MHz elements at TP PIF to a minimum.

● For G mode (SD-T292 only)

After adjustment as described below, picture may not be displayed correctly when receiving in another system. If this happens, perform adjustment for that system, or, for the best picture, perform adjustment for the M system.

Step No.	Adjustment Item	Input Signal		Adjustment Point	Adjustment Procedure
		Video	Audio		
2-1	F12 adjustment	V (1)	S (1)	F12 (T)	Adjust only when the picture is not displayed correctly.
2-2	Audio trap adjustment 1			F18 (T)	Reduce 33.4MHz elements at TP PIF to a minimum.
2-3	F19 adjustment			F19 (T)	Adjust only when the picture is not displayed correctly.
2-4	Audio trap adjustment 2			F20 (T)	Reduce 33.4MHz elements at TP PIF to a minimum.

● For I mode (SD-T292 only)

After adjustment as described below, picture may not be displayed correctly when receiving in another system. If this happens, perform adjustment for that system, or, for the best picture, perform adjustment for the M system.

Step No.	Adjustment Item	Input Signal		Adjustment Point	Adjustment Procedure
		Video	Audio		
2-1	Audio trap adjustment	V (1)	S (1)	F12 (T)	Reduce 32.9MHz elements at TP PIF to a minimum.
2-2	F18 adjustment			F18 (T)	Adjust only when the picture is not displayed correctly.
2-3	F19 adjustment			F19 (T)	
2-4	F20 adjustment			F20 (T)	

● For D and K modes (SD-T292 only)

After adjustment as described below, picture may not be displayed correctly when receiving in another system. If this happens, perform adjustment for that system, or, for the best picture, perform adjustment for the M system.

Step No.	Adjustment Item	Input Signal		Adjustment Point	Adjustment Procedure
		Video	Audio		
2-1	Audio trap adjustment	V (1)	S (1)	F12 (T)	Reduce 32.4MHz elements at TP PIF to a minimum.
2-2	F18 adjustment			F18 (T)	Adjust only when the picture is not displayed correctly.
2-3	F19 adjustment			F19 (T)	
2-4	F20 adjustment			F20 (T)	

7.5.2 Audio MONO Section

Step No.	Adjustment Item	Input Signal		Adjustment Point	Adjustment Procedure
		Video	Audio		
1	Audio distortion adjustment	V (1)	S (1)	L25 (T)	Adjust so that the distortion at the OUTPUT MONITOR AUDIO terminal is reduced to a minimum.

7.5.3 Audio STEREO Section
(US Stereo Area Only)

- Set the unit to the MAIN mode before performing the adjustment.

Step No.	Adjustment Item	Input Signal		Adjustment Point	Adjustment Procedure
		Video	Audio		
1	Separation adjustment	V (1)	S (2)	RV03 (I)	Adjust so that the output at the OUTPUT MINITOR AUDIO Rch (or Lch) at the rear is reduced to a minimum.
2			S (3)	RV06 (I)	Adjust so that the output at the OUTPUT MONITOR AUDIO Rch (or Lch) at the rear is reduced to a minimum.
3		Repeat steps 1 to 2 until the optimum separation is obtained.			
4	Stereo indicator illumination level adjustment	V (2)	S (4)	VR13 (T)	Adjust so that the on-screen stereo indication commences.

7.6 Control Block Adjustment

- The control block can be adjusted regardless of the TV broadcasting formats and standard systems.

7.6.1 PIONEER Picture Quality Standard Setting

If the picture quality standard has been altered after repairing the video section or replacing IC201 (CXK1008L ; non-volatile storage) for example, re-adjust the picture quality setting as follows :

1. Enter the picture quality standard setting mode (*1).
2. Set the picture quality with the remote control unit in the following order :

① Sharpness adjustment
Input the multi-burst signal and adjust so that the 500kHz/2MHz ratio at pins 41 of IC601 is 4/5.5.

② Brightness adjustment
Set the picture quality telop to 0. Then input any signal and adjust the sub brightness VR (VR700 ; Refer to Fig. 7-10) so that the optimum screen quality is obtained.

③ Contrast adjustment

④ Color adjustment

⑤ Tint adjustment
Input any signal and adjust so that the optimum screen quality is obtained.

3. Press the PICTURE MEMORY key (S987) in the front. The settings are stored in IC201.
4. The picture quality standard setting mode is released.

*** 1 Picture quality standard setting mode**

- How to enter the mode ;
  Short-circuit TP200 and TP201 in the TV COMPLEX assembly, or press simultaneously any three keys among ADD (S980), ERASE (S981), PICTURE MEMORY (S987) and COLOR SYSTEM (S986). The picture quality telop will change from cyan to red. (Refer to Fig. 7-7 * 2.) (For the SD-291, COLOR SYSTEM (S986) key is not used.)
- How to set the picture quality
  1. Press the PICTURE key on the remote control unit. Each time the key is pressed, the picture quality telop will change in the following sequence, as shown in Fig. 7-7 :
     COLOR→TINT→CONTRAST→BRIGHTNESS
     →SHARPNESS→COLOR
     Set the picture quality telop to the quality to be adjusted.
  2. Press ◀ ADJ ▶ keys on the remote control unit, *and the telop value will change. Set the value* as required.

Note : When all the necessary adjustment has been completed, be sure to press the PICTURE MEMORY key (S987) so that the setting is stored in IC201.

- How to release the mode
  If the picture quality standard setting mode has been entered by short-circuiting TP200 and TP201, release the short-circuit. If it has been entered by pressing the three keys simultaneously, press again these keys simultaneously. The picture quality telop will return from red to cyan.

*2 : When the picture quality standard setting mode is entered, all the picture quality telops will change from cyan to red.

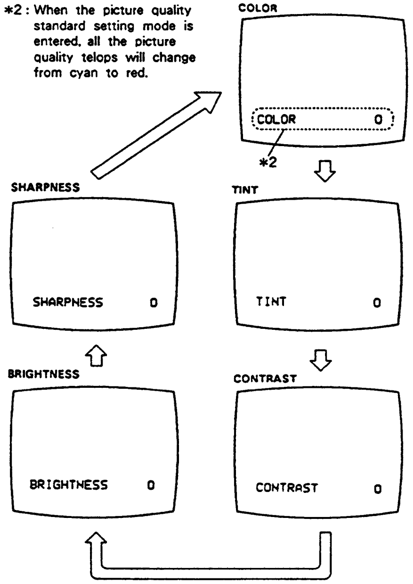


Fig. 7-7 Picture quality standard setting

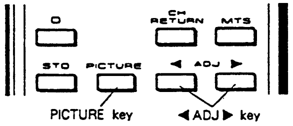


Fig. 7-8 Key of remote control

7.6.2 TEST operation

When TP200 and TP201 are short-circuited, the remote control key function changes as follows :

1. When the ADJ ▶ key on the remote control is pressed, the selected item becomes 32.
2. When the ADJ ◀ key on the remote control is pressed, the selected item becomes − 31.
3. The sleep timer count-down speed is multiplied by 256. However, if the sleep timer had been activated before short-circuiting TPs, the count-down speed will be multiplied by 256 after the sleep timer has once been deactivated.

7.6.3 Special Notes

If the microcomputer does not function as required even when the hardware conditions such as power supply, oscillation and $\overline{\text{RESET}}$ are satisfied, check the following terminals of IC200 (microcomputer).

1. Pin 34 (MAIN OFF terminal)
   While this terminal is LOW, the power relay RY901 should remain OFF.
2. Pin 17 (ENABLE terminal)
   No key input is accepted until this terminal becomes HIGH after the power relay RY901 is turned ON.
3. When an diode (such as 1SS252) is connected between pin 6 (cathode) and pin 16 (anode) of IC200, the tuner operation of the set is deactivated and the monitor TV mode is entered.
4. Normally, pin 5 of IC200 remains LOW. But in the PAL mode, each time the PICTURE MEMORY key (S987) is pressed, the level of pin 5 changes from LOW to HIGH and vice versa and the level is hold. In the other modes, the level of pin 5 remains LOW even though the PICTURE MEMORY key is pressed. (Pin 5 of IC200 acts as the tuner trap forced trigger when malfunction occurs in the PAL B/G mode.)
   For the SD-T291, pin 5 of IC205 always stays at the low level.
   Note : As pin 5 of IC200 is a open drain type, a resistance (of approx. 4.7 kilohms) should be connected to GND terminal.
5. Pin 4 of IC200 becomes HIGH with the CHANNEL PLAN switch (S989) set to the U.S. CATV/TV position, and becomes LOW with the switch set to the PAL/SECAM AREA position.
   For the SD-291, pin 4 of IC200 is at the high level in both the CATV and the TV positions.

7.6.4 X-ray Protection Circuit Check

Input monoscope signal or cross hatch signal, and apply DC +26.5V to the cathode of D516 in the POWER SUPPLY & DEFLECTION assembly. Check to see that pin 2 (X-ray terminal) of J12 in the POWER SUPPLY & DEFLECTION assembly changes from LOW (less than 2V) to HIGH (over 6V), and that within 100mS from this point, pin 4 (relay ON/$\overline{\text{OFF}}$ terminal) of J14 in the POWER SUPPLY & DEFLECTION assembly becomes LOW (less than 1V) and sub-power is turned OFF (the relay is turned OFF).

To return to the original state, turn ON the sub-power switch (S988 : FUNCTION/POWER) again.

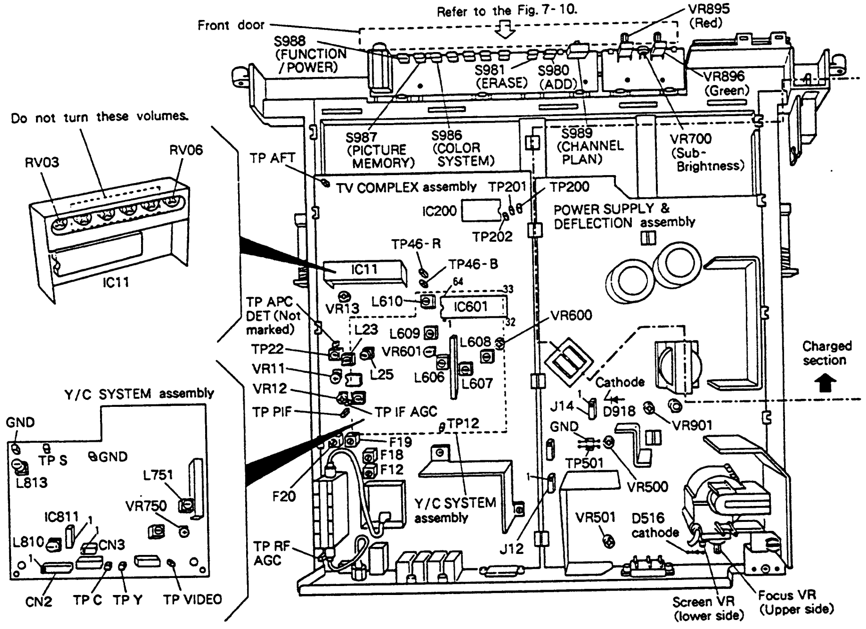

Front door
Refer to the Fig. 7-10.
VR895 (Red)
S988 (FUNCTION /POWER)
S981 (ERASE)
S980 (ADD)
VR896 (Green)
Do not turn these volumes.
RV03
RV06
IC11
TP AFT
S987 (PICTURE MEMORY)
S986 (COLOR SYSTEM)
S989 (CHANNEL PLAN)
VR700 (Sub-Brightness)
TV COMPLEX assembly
TP201
TP200
IC200
POWER SUPPLY & DEFLECTION assembly
TP46-R
TP202
IC11
TP46-B
64
33
TP APC DET (Not marked)
VR13
L610
IC601
32
VR600
L23
L609
TP22
VR601
L608
VR11
L25
L606
L607
Charged section
VR12
Cathode
Y/C SYSTEM assembly
TP PIF
TP IF AGC
J14
D918
GND
TP12
GND
VR901
TP S
GND
F19
F18
F12
TP501
L813
L751
F20
VR500
IC811
VR750
Y/C SYSTEM assembly
VR501
D516 cathode
L810
CN3
TP RF AGC
J12
CN2
TP C
TP Y
TP VIDEO
Screen VR (lower side)
Focus VR (Upper side)

Fig. 7-9 Adjustment points at the top

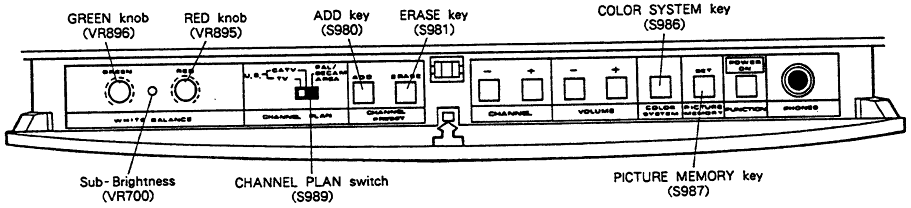

GREEN knob (VR896)
RED knob (VR895)
ADD key (S980)
ERASE key (S981)
COLOR SYSTEM key (S986)
Sub-Brightness (VR700)
CHANNEL PLAN switch (S989)
PICTURE MEMORY key (S987)

Fig. 7-10 Inside of the front door

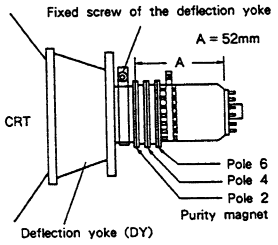

Fixed screw of the deflection yoke
A = 52mm
A
CRT
Pole 6
Pole 4
Pole 2
Purity magnet
Deflection yoke (DY)

Fig. 7-11 CRT periphery

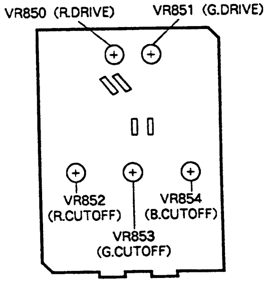
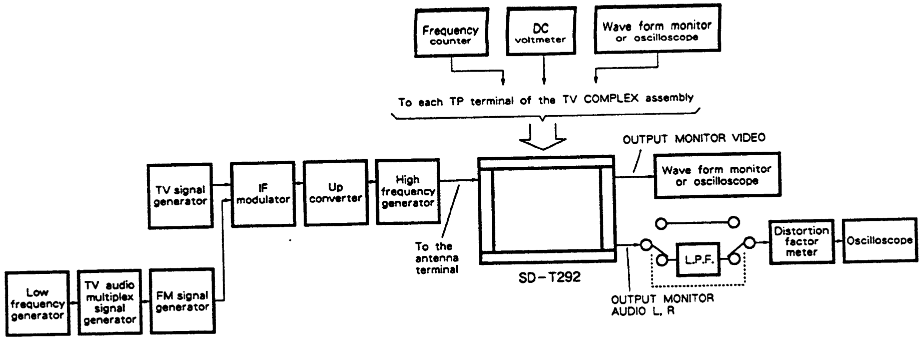

VR850 (R.DRIVE)
VR851 (G.DRIVE)
VR852 (R.CUTOFF)
VR854 (B.CUTOFF)
VR853 (G.CUTOFF)

Fig. 7-12 CRT assembly (From the copper foil side)


Frequency counter
DC voltmeter
Wave form monitor or oscilloscope
To each TP terminal of the TV COMPLEX assembly
OUTPUT MONITOR VIDEO
TV signal generator
IF modulator
Up converter
High frequency generator
Wave form monitor or oscilloscope
To the antenna terminal
SD-T292
L.P.F.
Distortion factor meter
Oscilloscope
Low frequency generator
TV audio multiplex signal generator
FM signal generator
OUTPUT MONITOR AUDIO L, R

L. P. F : 100Hz to 10kHz : $^{+0}_{-0.5}$ dB, 15.75kHz to 100kHz : less than − 40dB

Fig. 7-13 Connection diagram of the tuner block

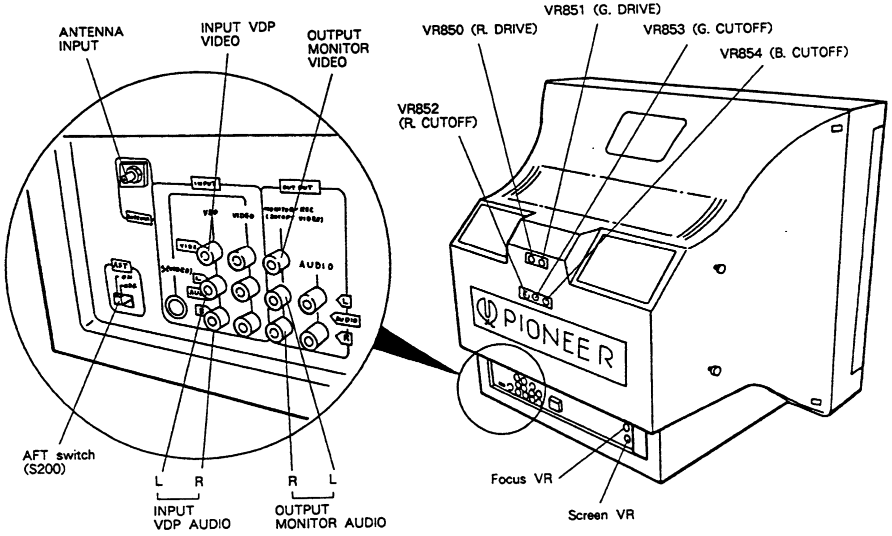

ANTENNA INPUT
INPUT VDP VIDEO
OUTPUT MONITOR VIDEO
VR851 (G. DRIVE)
VR850 (R. DRIVE)
VR853 (G. CUTOFF)
VR854 (B. CUTOFF)
VR852 (R. CUTOFF)
AUDIO
PIONEER
AFT switch (S200)
L
R
INPUT VDP AUDIO
R
L
OUTPUT MONITOR AUDIO
Focus VR
Screen VR

Fig. 7-14 Adjustment point at the rear

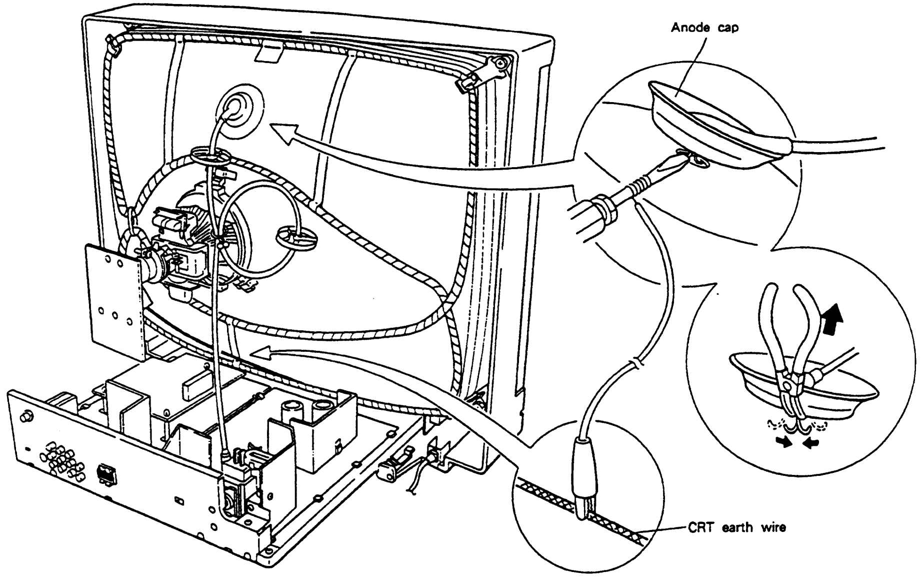
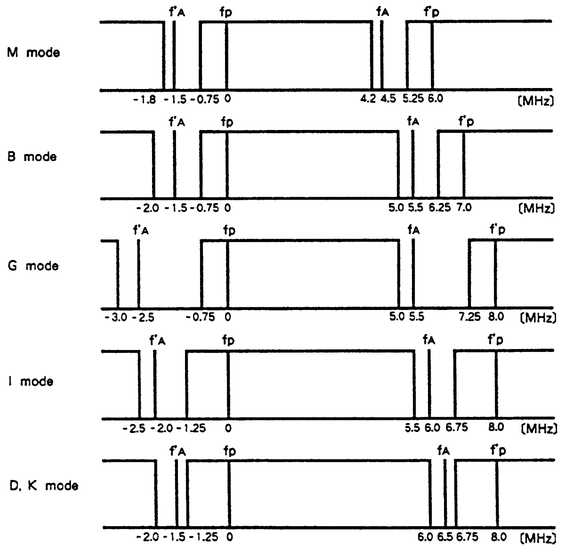

Anode cap
CRT earth wire

Fig. 7-15 Removal of the anode cap



NOTE : fp = Video carrier
fA = Audio carrier
f'p = Upper adjacent video carrier
f'A = Lower adjacent audio carrier

Fig. 7-16 TV standard system frequency band (RF signal)

7.7 Purity Adjustment

● Preparation

1. Install the set so that the screen faces east or west.
2. Demagnetize the CRT sufficiently.
3. Perform rough adjustment of convergence as described in 7.8.
4. Input white 100% signal and perform aging over 30 minutes.
5. Demagnetize the CRT again.

● Adjustment

1. Demagnetize the CRT sufficiently.
2. Observe the point L and R as indicated in Fig. 7-17 using a loupe. Find how the green beam on the shadow mask is chipped off and to which one of the four types shown in Fig. 7-18 (incorrect screen) it corresponds.
3. Perform adjustment as shown in Fig. 7-18 so that the best purity is obtained.

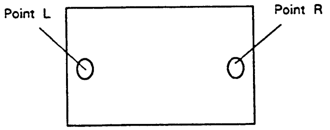
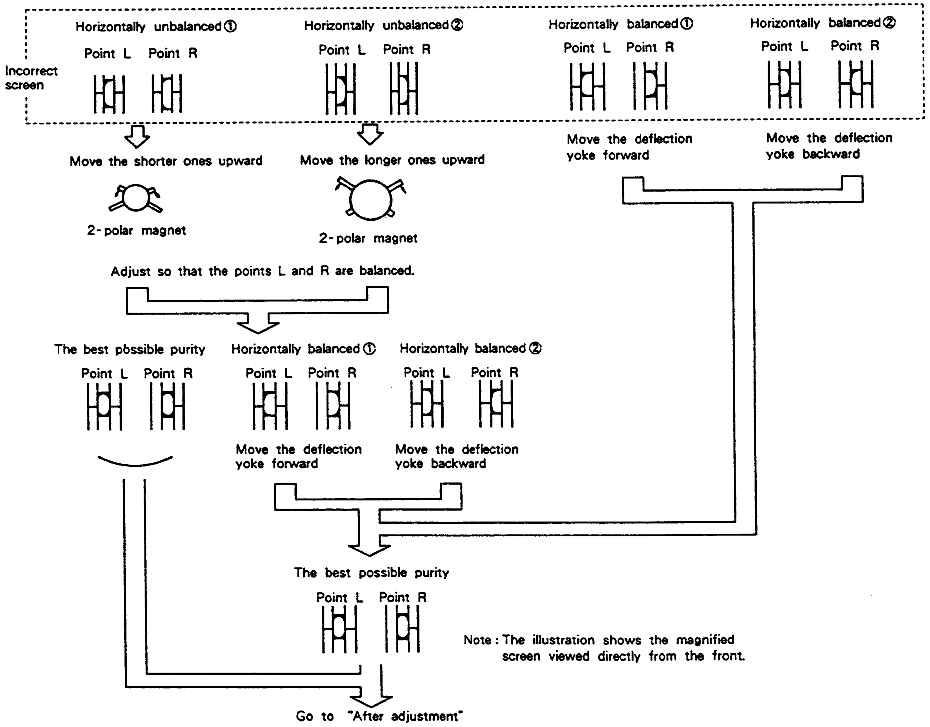

Point L
Point R

Fig. 7-17 Purity observation


Incorrect screen
Horizontally unbalanced ①
Point L Point R
Horizontally unbalanced ②
Point L Point R
Horizontally balanced ①
Point L Point R
Horizontally balanced ②
Point L Point R
Move the shorter ones upward
2-polar magnet
Move the longer ones upward
2-polar magnet
Move the deflection yoke forward
Move the deflection yoke backward
Adjust so that the points L and R are balanced.
The best pbssible purity
Point L Point R
Horizontally balanced ①
Point L Point R
Move the deflection yoke forward
Horizontally balanced ②
Point L Point R
Move the deflection yoke backward
The best possible purity
Point L Point R
Go to "After adjustment"

Note : The illustration shows the magnified screen viewed directly from the front.

Fig. 7-18 Purity adjustment

● After adjustment

1. Check to see that the deflection yoke is not inclined.
2. Tighten the fixing screw of the deflection yoke, and insert the rubber wedge temporarily at the top of the yoke.
3. Perform rough adjustment of the white balance as described in 7.2.2, step 10.
4. Demagnetize the CRT sufficiently.

● Peripheral purity adjustment

When bad purity is observed at the four corners of the screen, adjust it as follows :

1. Install the set so that the screen faces east or west. Input white 100% signal and demagnetize the CRT sufficiently.
2. Perform aging for over 30 minutes, and then demagnetize the CRT again.
3. At points A, B, C and D of the screen periphery, adhere the rubber magnet (ZMG018) so that the deformed fluorescent material RGB (see Fig. 7-21 b and c) becomes as shown in Fig. 7-21 a. If the fluorescent material is deformed at point A in Fig. 7-19, for example, temporarily attach the rubber magnet at the position 4-5 cm apart from the point A on the diagonal, closer to the deflection yoke (marked A' in Fig. 7-20). Decide the side of the magnet to be adhered, and the number, angle and position by changing them until the best form of the fluorescent material is obtained. Adhere definitely the rubber magnet with cloth tape and adhesive material (silicone cement). The rubber magnet (ZMG018) will be provided for service. A sheet contains 50 pieces of magnets. Use them piece by piece.
4. Confirm that ununiformity in the white screen does not appear with the screen faced in any direction.

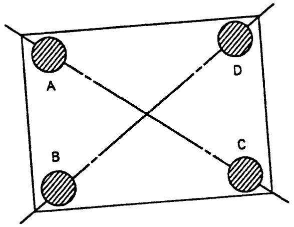


Fig. 7-19 CRT front side

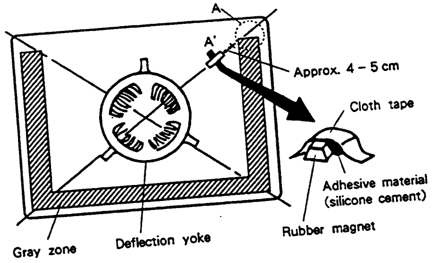

A
A'
Approx. 4-5 cm
Cloth tape
Adhesive material (silicone cement)
Rubber magnet
Gray zone
Deflection yoke

Fig. 7-20 CRT rear side

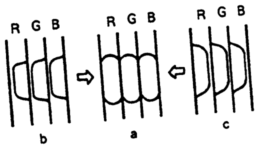

R G B
R G B
R G B
b
a
c

Fig. 7-21 RGB fluorescent material

7.8 Convergence adjustment

● Perparation

1. Make sure that the deflection yoke is not inclined.
2. Install the set so that the screen faces south, and input the cross hatch signal.
3. Demagnetize the CRT sufficiently.

● Center convergence adjustment

Turn the purity magnet so that the vertical and horizontal lines of red, green and blue at the screen center match and become white. Proceed the convergence adjustment as follows :

1. Demagnetize the CRT sufficiently.
2. Vary the opening angle of the 4-polar magnets until the center of vertical red and blue lines match at the screen center. (See Fig. 7-22-1-a.)
3. Keep the 4-polar magnets opening angle unchanged and rotate the 2 magnets together until the center of horizontal red and blue lines match at the screen center. (See Fig. 7-22-1-b.)
4. Vary the opening angle of the 6-polar magnets until the center of vertical red/blue and green lines match at the screen center. (see Fig. 7-22-2-c.)
5. Keep the 6-polar magnets opening angle unchanged and rotate the 2 magnets together until the center of horizontal red/blue and green lines match at the screen center. (See Fig. 7-22-2-d.)
6. After adjustment, demagnetize the CRT sufficiently.

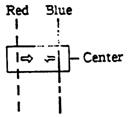
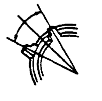
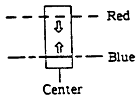
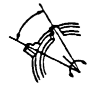
	Movement of screen center section	Magnet operation
a	Match vertical lines of red and blue at center of screen. 	Vary the opening angle of the 4-polar magnet. 
b	Match the horizontal lines of red and blue at the center of screen. 	Keep the 4-polar magnet opening angle in a stable condition and rotate 2 sheets together. 

Fig. 7-22-1 Center convergence adjustment

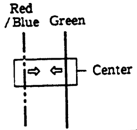
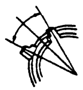
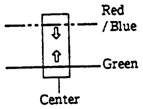
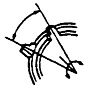
	Movement of screen center section	Magnet operation
c	Match the vertical lines of red, blue and green at the center of screen. 	Vary the opening angle of the 6-polar magnet. 
d	Match the horizontal lines of red, blue and green at the center of screen. 	Keep the 6-polar magnet opening angle in a stable condition and rotate 2 sheets together. 

Fig. 7-22-2 Center convergence adjustment

● Center cross adjustment

Turn the core of the deflection yoke (see Fig. 7-23) so that the center of horizontal red and blue lines match and become white (see Fig. 7-24).

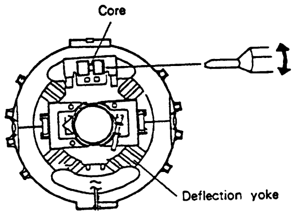


Fig. 7-23 Core of the deflection yoke

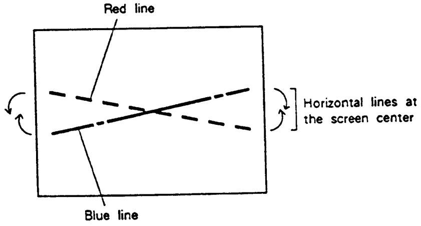
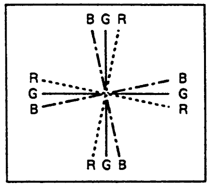
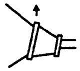
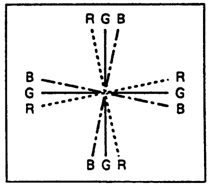
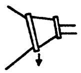
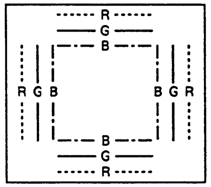
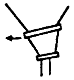
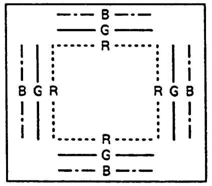
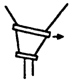


Fig. 7-24 Center cross adjustment

● Periphery convergence adjustment

1. Demagnetize the CRT sufficiently.
2. Vary the deflection yoke angle as shown in Fig. 7-25 so that the horizontal and vertical red, green and blue lines match to become white at the periphery sections on the screen.
3. Insert the rubber wedge temporarily at the top of the deflection yoke.

Note : After the adjustment, check to see that the center cross is not slipped off. If it is, adjust it by turning the core of the deflection yoke as previously described.

	Symptom	Countermeasure
1		 Orient the deflection yoke upward.
2		 Orient the deflection yoke downward.
3		 Orient the deflection yoke to the left.
4		 Orient the deflection yoke to the right.

R : Red
G : Green
B : Blue

Fig. 7-25 Periphery convergence adjustment

● Periphery convergence adjustment using iron plates

Perform the periphery convergence adjustment by the iron plates after completing the center convergence adjustment, the center cross adjustment, and the normal periphery convergence adjustment.

1. Install the set so that the screen faces south. Input the cross hatch signal and demagentize the CRT sufficiently.
2. Adjust the periphery convergence by using the two iron plates. (Refer to Fig. 7-26.) For how to use the iron plates, see fig. 7-27.
   Note : To make compensation value greater, place the iron plate closer to the neck of the CRT.
3. After adjusting the periphery convergence, fix the iron plates with an adhesive agent and demagnetize them.

No.	Appearance	Part No.
1	▨	ZMG006
2	▨	ZMG011

Note : A greater compensation can be obtained by the iron plate No. 2.

Fig. 7-26 Two iron plates

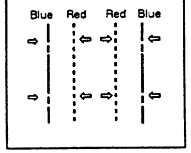
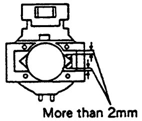
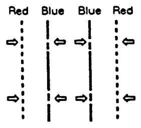
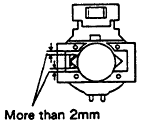
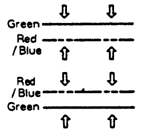
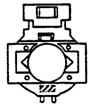
No.	Movement of screen periphery	Iron plate operation
1	Match vertical lines of blue and red at the left and right of the screen.  	Insert the iron plate No. 1 as illustrated. Adjust the convergence by changing the position of the plate and not by inclining it. 
2	Match vertical lines of blue and red at the left and right of the screen.  	Insert the iron plate No. 1 as illustrated. Adjust the convergence by changing the position of the plate and not by inclining it. 
3	Match the horizontal lines of red/blue and green at the top and bottom of the screen.  	Insert the iron plate No.1 or No.2 at the top or the bottom of the deflection yoke. Adjust the convergence by changing the position of the plates.  Note : If the compensation by the iron plates is too strong, the center vertical lines may be slipped off.

Fig. 7-27 Periphery convergence adjustment

● Corner convergence adjustment

Perform the corner convergence adjustment after completing the center convergence adjustment, the normal periphery convergence adjustment, the center cross adjustment, and the periphery convergence adjustment using the iron plates.

1. Install the set so that the screen faces south. Input the cross hatch signal and demagnetize the CRT sufficiently.
2. Adjust the corner convergence by using the ferrite sheet. For how to use the ferrite sheet, see Fig. 7-30-1 and 7-30-2. For how to attach the ferrite sheet, refer to the note below.
3. After adjusting the corner convergence, adjust finely the center, periphery and corner convergence so that the screen becomes well balanced.

Note : How to attach the ferrite sheet

1. Strip the released paper off and attach the ferrite sheet to the CRT (the gap between deflection yoke and CRT).

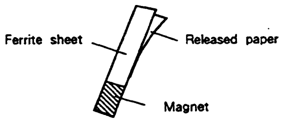


Fig. 7-28 Ferrite sheet

2. Stick the cotton tape as close to the magnet portion as possible, and apply silicon cement as shown in Fig. 7-29.

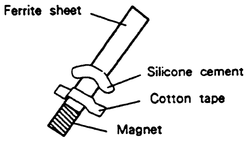
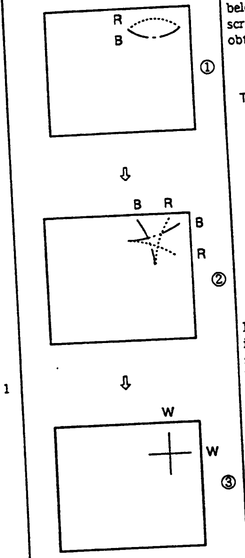
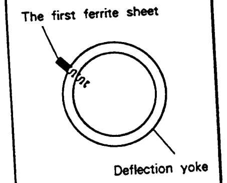
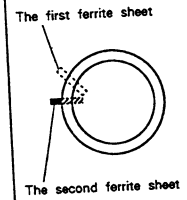
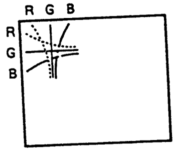
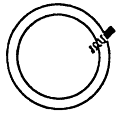
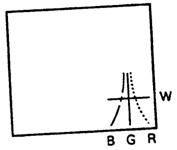
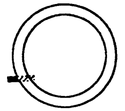
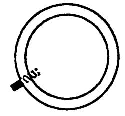
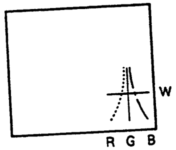
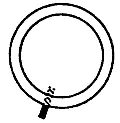
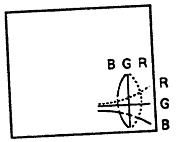
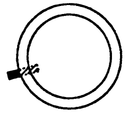
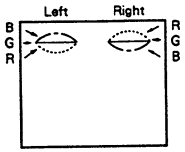
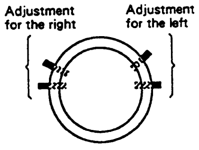
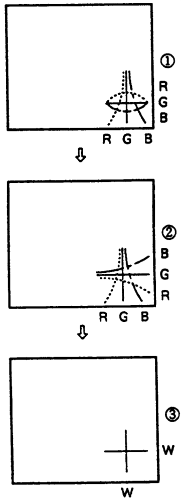
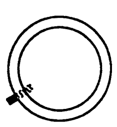
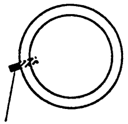
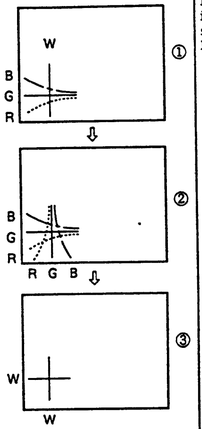
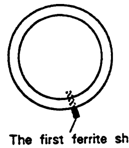
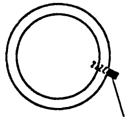
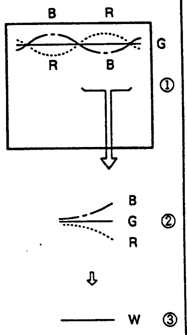
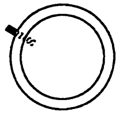
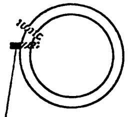


Fig. 7-29 How to attach the ferrite sheet

No.	Example of incorrect convergence	Adjustment
1	S-shape at the center  	Adjust with two ferrite sheets. Insert one sheet as illustrated below, and adjust so that the screen ② to the left is obtained.  Insert the second sheet as illustrated below, and adjust so that the screen ③ to the left is obtained.  Note that the horizontal line will be separated into two lines at the center if the ferrite sheets are inserted too deeply.
2	Horizontal/vertical lines do not match at the corner.  	Insert the ferrite sheet to relatively deeper position. 
3	Vertical lines do not match at the corner : Ex. 1  	Insert the ferrite sheet as illustrated below.  If the horizontal lines also do not match, insert the ferrite sheet as illustrated below. 
4	Vertical lines do not match at the corner : Ex. 2  	Insert the ferrite sheet as illustrated below. 
5	Horizontal/vertical lines do not match : Ex. 1  	Insert the ferrite sheet deeply.  Note : When this adjustment is performed, the horizontal lines will be slipped off. Readjust by the core of the deflection yoke, as described in page 54.

R ; Red B ; Blue
G ; Green W ; White

Fig. 7-30-1 Adjustment using the ferrite sheet (1)

No.	Example of incorrect convergence	Adjustment
6	S-shape at the center in both left and right on the screen  	Application of the case No.1. Use four ferrite sheets and adjust in both left and right on the screen.  Note that the horizontal line will be separated into two lines at the center if the ferrite sheets are inserted too deeply.
7	Horizontal/vertical lines do not match : Ex. 2  ① R G B R G B ② B G R R G B ③ W W	Application of the case No.1. Use two ferrite sheets to adjust. Insert one ferrite sheet as illustrated below, and adjust so that the screen ② to the left is obtained.  Insert the second ferrite sheet as illustrated below, and adjust so that the screen ③ to the left is obtained.  The second ferrite sheet Note that the horizontal line will be separated into two lines at the center if the ferrite sheets are inserted too deeply.
8	Horizontal/vertical lines do not match at the corner : Ex. 3  W ① B G R ② B G R R G B ③ W W	Use two ferrite sheets. Insert one ferrite sheet as illustrated below, and adjust so that the screen ② to the left is obtained.  The first ferrite sheet Insert the second ferrite sheet as illustrated below, and adjust so that the screen ③ to the left is obtained.  The second ferrite sheet
9	 	Use four ferrite sheets. Insert one ferrite sheet as illustrated below. and adjust so that the top right corner of the screen becomes as shown by the illustration ② to the left.  Insert the second ferrite sheet as illustrated below, and adjust so that the white line is obtained as shown by the illustration ③ to the left.  The second ferrite sheet Adjust the left side of the screen in the same way.

R ; Red　B ; Blue
G ; Green　W ; White

Fig. 7-30-2 Adjustment using the ferrite sheet (2)

Notes
1. There are two types of ferrite sheets ; the bigger one and the smaller one. The bigger one gives a stronger effect. Parts No. : **ZMG016** (the bigger one)
   ZMG015 (the smaller one)
2. The illustrations used above show the rear of the deflection yoke.
3. When inserting the ferrite sheet, always check the entire screen (not only the portion influenced by the ferrite sheet).
4. The above illustrations are to be used as a reference.

- **After adjustment**

Input the cross hatch signal and finely adjust the entire screen.

7.9 Insertion of Rubber Wedge

- Use 3 rubber wedges. (One of the 3 wedges has already been used temporarily.)
- While taking precaution of the convergence and purity quality, insert and fix the rubber wedges as follows :

1. Apply silicone cement to the 2 rubber wedges and insert them carefully to the lower section of the deflection yoke, taking care so that the yoke does not tilt. Fix them with an adhesive tape.
2. Remove the rubber wedge temporarily inserted, taking care so that the deflection yoke does not tilt.
3. Apply silicone cement to the removed rubber wedge and reinsert it to the position where it was temporarily inserted, taking care so that the deflection yoke does not tilt. Fix the rubber wedge with an adhesive tape.
4. Confirm that the purity, convergence and screen position remain correct.

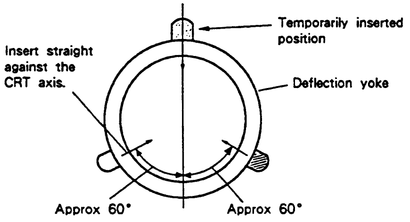

Temporarily inserted position
Insert straight against the CRT axis.
Deflection yoke
Approx 60°
Approx 60°

Fig. 7-31 Insertion of rubber wedge

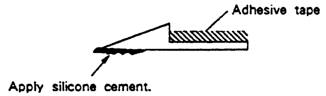


Fig. 7-32 Rubber wedge

8. IC DESCRIPTIONS

■ PD5085-A

TV system control microcomputer

● Pin Function

Pin	Pin name	Function and operation	Active
1	Vcc	Power supply voltage input (+5V)	
2	AVss	Ground	
3	VREF	Voltage reference (+5V)	
4	US/$\overline{\text{EUR}}$	N.C.	
5	FORCE PAL		
6	$\overline{\text{KEY OUT3}}$		
7	$\overline{\text{KEY OUT2}}$	Key matrix output	L
8	$\overline{\text{KEY OUT1}}$		
9	$\overline{\text{KEY OUT0}}$		
10	ALLOCATION	Allocation input H ; USTV, *3 M ; US CATV, L ; EUR	
11	TEST	Test mode input H ; OFF, M ; TEST1, L ; TEST2	
12	X-RAY	High voltage detection input	
13	AFT S	Tuning direction voltage input H ; UP, M ; CENTER, L ; DOWN	
14	STB	OSD data output	
15	CLK	OSD and PLL data output	
16	DATA		
17	ENABLE	PLL data output and main power rise up detection	H
18	$\overline{\text{SECAM}}$ *4	System selection input	L
19	$\overline{\text{PAL}}$ *4		
20	$\overline{\text{NTSC}}$ *4		
21	3.58/$\overline{\text{4.43}}$ *4	System selection input H : 3.58, L : 4.43	
22	H.SYNC	Station detector input (OK at 13k-19K)	
23	MONO	MTS selection output	H
24	$\overline{\text{SAP OUT}}$		L
25	$\overline{\text{MAIN OUT}}$		
26	$\overline{\text{INT1}}$	+5V	L
27	CNVss	Ground	
28	$\overline{\text{RESET}}$	Reset input	L
29	X IN	Clock input	
30	X OUT	Clock output (4MHz)	
31	ϕ	N.C.	
32	Vss	Ground	
33	$\overline{\text{REMOTE}}$	Remote control signal input	L
34	$\overline{\text{MAIN OFF}}$	MAIN power rise down detection	
35	$\overline{\text{LOCK}}$	PLL lock input	
36	$\overline{\text{SAP}}$	SAP (broadcasting signal mode) input	
37	$\overline{\text{STEREO}}$	STEREO (broadcasting signal mode) input	
38	AFT $\overline{\text{ON}}$/OFF	AFT switch input H : OFF, L : ON	
39	S $\overline{\text{IN}}$/OUT	S terminal input det. H : OUT, L : IN	
40	$\overline{\text{50}}$/60 *5	Field frequency det. H : 60Hz, L : 50Hz	
41	TV MUTE	Tuner video muting signal output	H
42	A MUTE	Audio muting signal output	
43	CRT MUTE	Video muting signal output	
44	SECAM *4	System selection output	H
45	PAL *4		
46	NTSC 4.43 *4		
47	NTSC *4		
48	AUTO *4		
49	FUNC 2	Function selection output	*1
50	FUNC 1		
51	FUNC 0		
52	TRAP 1 *4	Video trap and filter selection output	*2
53	TRAP 0 *4		
54	LOAD	D/A converter data output	
55	CLOCK		
56	DATA OUT		
57	RELAY $\overline{\text{ON}}$/OFF	Relay output H : OFF, L : ON	
58	OSC	Memory control output	
59	$\overline{\text{CLK}}$		L
60	$\overline{\text{CE}}$		L
61	$\overline{\text{KEY I3}}$/IO4	TV/MONITOR selection input (H : TV, L : MONITOR) and memory control output	
62	$\overline{\text{KEY I2}}$/IO3	Key matrix input (L) and memory control output	
63	$\overline{\text{KEY I1}}$/IO1		
64	$\overline{\text{KEY I0}}$/IO1		

*1

Pin	TV	VDP	VIDEO (pin input)	VIDEO (S input)
49	L	L	L	H
50	L	H	H	H
51	L	L	H	H

*2

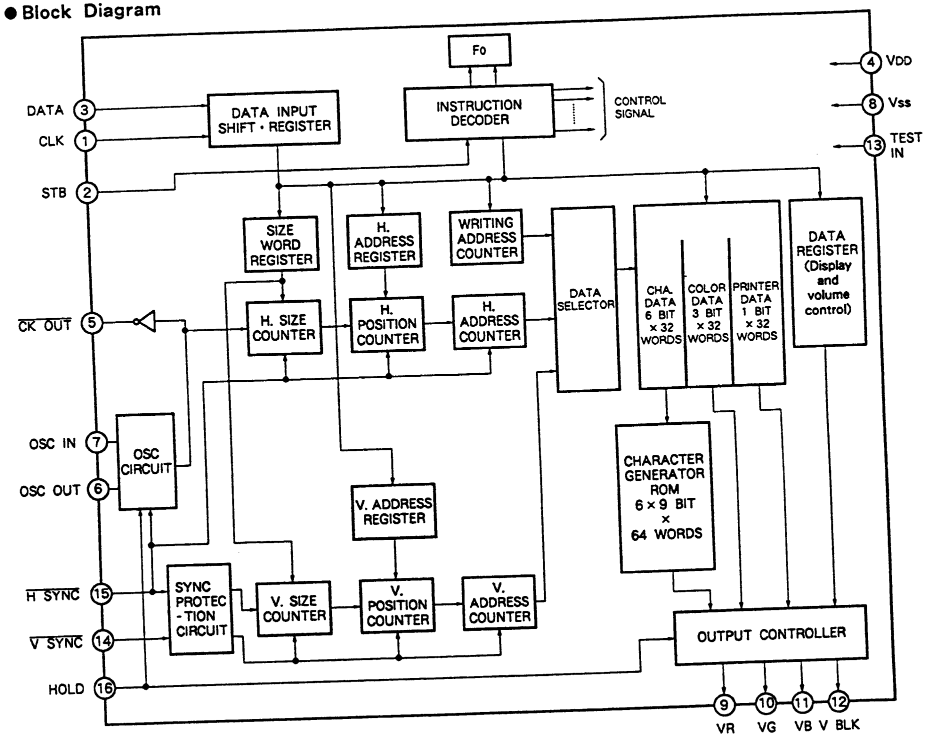
Pin	WHITE/ BLACK	PAL/ 4.43 NTSC	SECAM	NTSC
52	L	L	H	H
53	L	H	L	H

*3 : H ; USTV, M ; US CATV at the SD-291/R/G type.
*4 : Not used at the SD-291/R/G type.
*5 : Field frequency is always 60Hz at the SD-291/R/G type.

■ UPD6143C-001

Display IC

● Block Diagram


Fo
INSTRUCTION DECODER
CONTROL SIGNAL
DATA INPUT SHIFT • REGISTER
DATA ③
CLK ①
STB ②
④ VDD
⑧ Vss
⑬ TEST IN
SIZE WORD REGISTER
H. ADDRESS REGISTER
WRITING ADDRESS COUNTER
DATA SELECTOR
CHA. DATA 6 BIT ×32 WORDS
COLOR DATA 3 BIT ×32 WORDS
PRINTER DATA 1 BIT ×32 WORDS
DATA REGISTER (Display and volume control)
CK OUT ⑤
H. SIZE COUNTER
H. POSITION COUNTER
H. ADDRESS COUNTER
OSC IN ⑦
OSC OUT ⑥
OSC CIRCUIT
CHARACTER GENERATOR ROM 6×9 BIT × 64 WORDS
V. ADDRESS REGISTER
H SYNC ⑮
V SYNC ⑭
HOLD ⑯
SYNC PROTEC-TION CIRCUIT
V. SIZE COUNTER
V. POSITION COUNTER
V. ADDRESS COUNTER
OUTPUT CONTROLLER
⑨ VR
⑩ VG
⑪ VB
⑫ V BLK

● Pin Functions

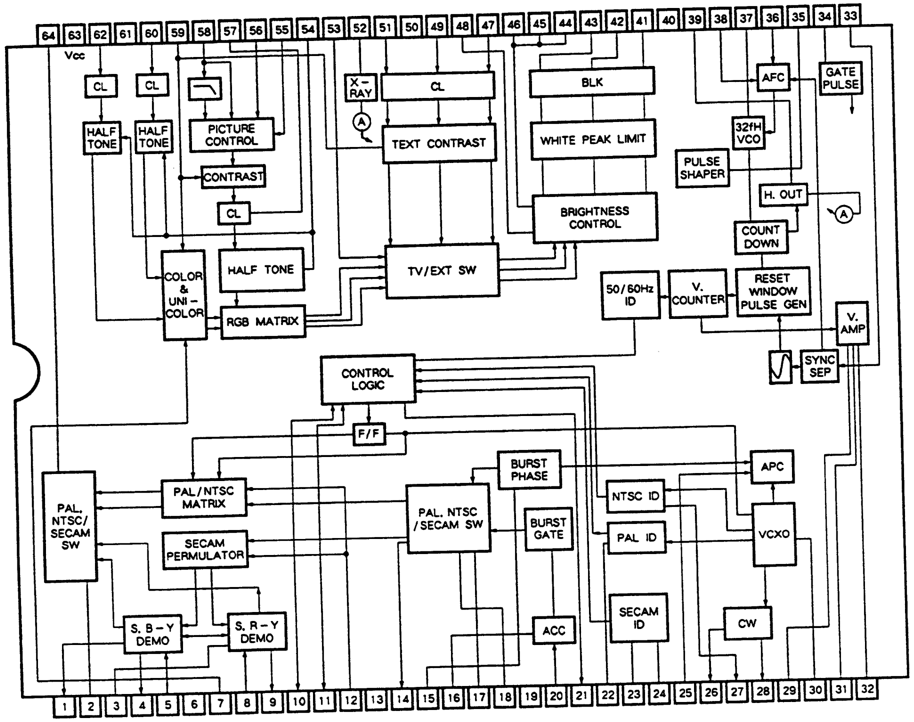
Pin	Pin name	Function and Operation
1	CLK	Clock input for data reading
2	STB	Strobe input, reading 8 bit data at rise up. When the 8 bit data is character data, one address is increased at rise down.
3	DATA	Control data input
4	VDD	Power supply input (+5V)
5	$\overline{\text{CK OUT}}$	N.C.
6	OSC OUT	Connect capacitor and coil for oscillation
7	OSC IN	
8	Vss	Ground
9	VR	R/G/B letter data output Active : H
10	VG	
11	VB	
12	V BLK	Blanking signal output
13	TEST IN	Test clock input. Ordinary, connect to the ground (VSS)
14	$\overline{\text{V SYNC}}$	V. SYNC signal input Active : L
15	$\overline{\text{H SYNC}}$	H. SYNC signal input Active : L
16	HOLD	L : oscillation stop VR/VG/VB/V BLK outputs are compulsorily L level. Ordinay, set the H level

■TA8659AN

Multi color

TA8659AN is an integrated circuit with video/chroma /deflection control capabilities for NTSC, PAL and SECAM systems which can also function as a teletext interface. It automatically discriminates between 4.43 and 3.58MHz subcarrier signals.

● Block Diagram


Vcc
CL
CL
HALF TONE
HALF TONE
PICTURE CONTROL
CONTRAST
CL
COLOR & UNI-COLOR
HALF TONE
RGB MATRIX
X-RAY
A
CL
TEXT CONTRAST
TV/EXT SW
BLK
WHITE PEAK LIMIT
BRIGHTNESS CONTROL
PULSE SHAPER
AFC
GATE PULSE
32fH VCO
H. OUT
A
COUNT DOWN
RESET WINDOW PULSE GEN
50/60Hz ID
V. COUNTER
V. AMP
SYNC SEP
CONTROL LOGIC
F/F
PAL, NTSC/ SECAM SW
PAL/NTSC MATRIX
SECAM PERMULATOR
S. B-Y DEMO
S. R-Y DEMO
PAL, NTSC /SECAM SW
BURST PHASE
BURST GATE
ACC
NTSC ID
PAL ID
SECAM ID
APC
VCXO
CW
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33

● Pin Functions

Pin	Pin name	Function and Operation
1	SECAM B−Y *1	SECAM B−Y deemphasis
2	R−Y OUT	R−Y color-difference signal output
3	SECAM R−Y *1	SECAM R−Y deemphasis
4	SECAM B−Y DET. *1	Connect the tank coil for SECAM B−Y detection
5		
6	Vcc	+12V power supply for chroma
7	COLOR CONTROL	COLOR control
8	SECAM R−Y DET. *1	Connect the tank coil for SECAM R−Y detection
9		
10	SW1 *1	AUTO : discrimination signal output MANUAL : forced signal input
11	SW2 *1	
12	DL IN *1	1H delay signal input of PAL and SECAM color signal
13	DC BIAS *1	DC bias for PAL and NTSC matrix circuit
14	DL OUT *1	PAL and SECAM color signal for 1H delay line
15	TINT	Tint control
16	ACC FILTER	Connect the filter for ACC detector
17	DC	DC feedback for PAL and NTSC color signal amplifier
18	SECAM IN/50/60 *2	SECAM color signal input. 50/60Hz discrimination signal output 60Hz : High (7.43V) 50Hz : Low (4.43V)
19	GND	Ground
20	P/N IN *1	PAL and NTSC color signal input
21	SW3 *1	AUTO : discrimination signal output MANUAL : forced signal input
22	PAL ID *1	PAL identify
23	SECAM ID *1	SECAM identify
24	SECAM REF. *1	SECAM reference (4.328MHz)
25	APC	APC filter
26	4.43MHz X'TAL *1	4.43MHz color subcarrier for oscillater circuit
27	NTSC ID	NTSC identify
28	3.58MHz X'TAL	3.58MHz color subcarrier for oscillater circuit
29	V. DRIVE	Vertical output
30	VCXO	Color subcarrier oscillater circuit

Pin	Pin name	Function and Operation
31	V. RAMP	V. ramp waveform generator
32	V. NFB	AC • DC feedback terminal for V. out
33	SYNC SEP	Input terminal for H. and V. SYNC SEP circuit
34	G. PTC	For gate pulse generation
35	H. BLK	Blanking pulse input
36	AFC FILTER	H.AFC filter
37	VCO	32fH oscillater circuit
38	H. AFC IN	H.AFC pulse input
39	H. OUT	H. output
40	H. Vcc	+9V power supply
41	R OUT	R output
42	G OUT	G output
43	B OUT	B output
44	R CLAMP	R clamp
45	G CLAMP	G clamp
46	B CLAMP	B clamp
47	R IN	Exite R signal input
48	BRIGHT	Bright control
49	G IN	Exite G signal input
50	GND	Ground
51	B IN	Exite B signal input
52	X−RAY	Overvoltage protection circuit
53	TV/EXT	TV signal and exite RGB signal select switch H (>1V) : Exite RGB signal L (<1V) : TV signal
54	HALF TONE	Half tone switch
55	SHARPNESS	Sharpness control and video muting
56	SHP IN	Secondary differential signal input
57	Y. CLAMP	Pedestal clamp
58	Y IN	Synchronous negative video signal input
59	CONTRAST	Video and color gain control
60	R−Y IN	R−Y signal input
61	Vcc	+12V power supply
62	B−Y IN	B−Y signal input
63	Vcc	+12V power supply for RGB output circuit
64	B−Y OUT	B−Y color-difference signal output

*1 ; Not used at the SD-291/R/G type.

*2 ; Pin 18 is operated as the 50/60Hz discrimination signal output at the SD-291/R/G type, and position always stays at the high level of 60Hz.

■ TA8615N

System switch

● Pin Functions

Pin	Pin name	Function and Operation	Pin	Pin name	Function and Operation
1	OSD1 (PAL)	On screen signal output L : PAL	16	MIXER OUT	6.0MHz SIF signal output
2	OSD2 (SECAM)	On screen signal output L : SECAM	17	6M TUNE	6.0MHz tuning coil connect terminal for converter
3	VIDEO IN	N.C.			
4	OSD3 (NTSC)	On screen signal output L : NTSC	18	S/H	Sample and hold of SIF selection signal
5	GND	Ground	19	GND	Ground
6	VIDEO IN	N.C.	20	4.5M TUNE	4.5MHz tuning coil connect terminal
7	PAL MODE IN	Forced signal input Forced PAL : H, AUTO : L	21	4.5M TUNE	
			22	Vcc	Power supply viltage (+9V)
8	SECAM MODE IN	Forced signal input Forced SECAM : H, AUTO : L	23	SW3	I/O interface terminal
			24	SIF 6M IN	6MHz SIF signal input
9	SIF OUT	SIF signal output switch the select signal (4.5M/OTHER).	25	4.5M/OTHER	4.5MHz/OTHER SIF signal discrimination output 4.5MHz : L, OTHER : H
10	NTSC (4.43) MODE IN	Forced signal input NTSC (4.43) : H, AUTO : L	26	CHROMA TRAP SWITCH	Chroma trap switch output H : 9V, L : 0V
11	NTSC (3.58) MODE IN	Forced signal input NTSC (3.58) : H, AUTO : L			
12	MIXER IN	5.5, 6.0 and 6.5MHz SIF signal input	27	SIF 4.5M IN	4.5MHz SIF signal input
13	V.PULSE IN	V. pulse input	28	SW2	I/O interface terminal
14	OSC	Oscillator	29	SW1	I/O interface terminal
15	OSC		30	VIDEO OUT	N.C.

■ UPD6326C

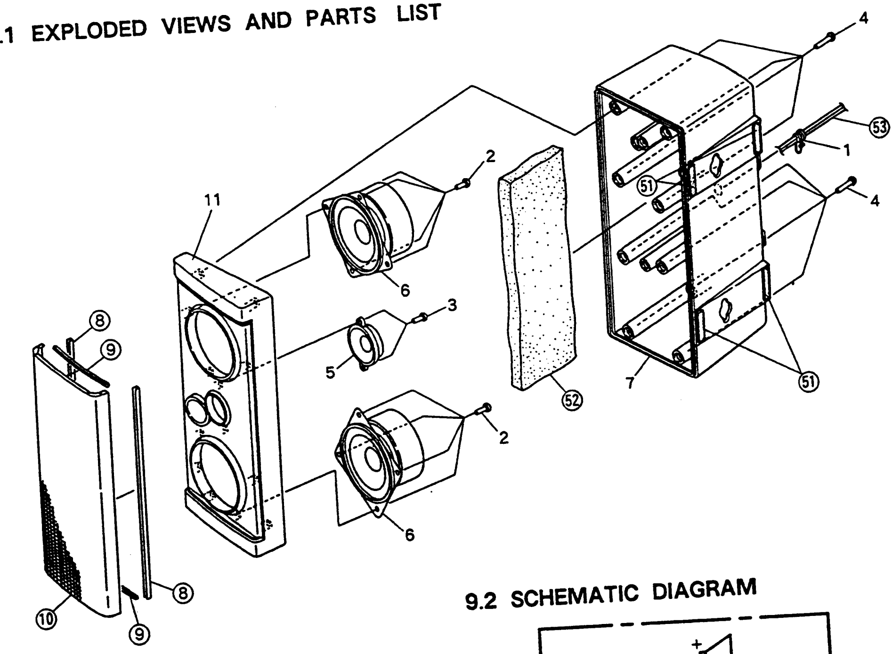
6 BIT D/A converter

● Pin Function

Pin	Pin name	Function and Operation	Pin	Pin name	Finction and Operation
1	Vcc	Power supply of the interface	9	DA 7	N.C.
2	DATA IN	Control data (serial) input	10	DA 6	N.C.
3	CLOCK	Shift clock input for data reading	11	DA 5	D/A converter output 1 – 5
4	LOAD	Load pulse input	12	DA 4	
5	OPTION	N.C.	13	DA 3	
6	DATA OUT	N.C.	14	DA 2	
7	DA 8	D/A converter output 8	15	DA 1	
8	Vss	Ground	16	VDD	Reference voltage for D/A converter

9. SP ASSEMBLY

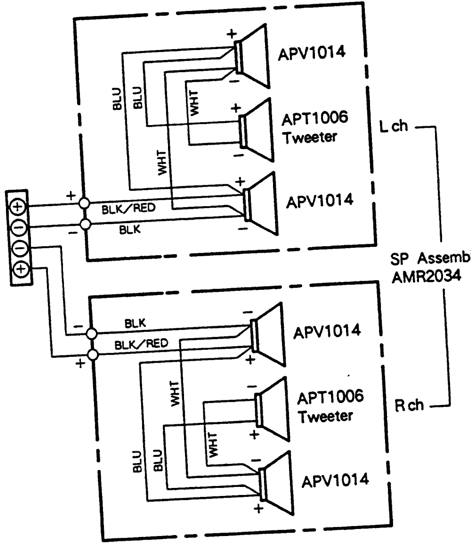
9.1 EXPLODED VIEWS AND PARTS LIST



Parts List

Mark	No.	Part No.	Description
	1	AEC-358	Strain relief
	2	BPZ30P080FMC	Screw
	3	BPZ30P120FMC	Screw
	4	BPZ30P140FMC	Screw
	5	APT1006	Tweeter
	6	APV1014	Speaker
	7	AMR1903	Rear baffle
	8		Spacer A
	9		Spacer B
	10		Punching net
	11	AMR1730	Front baffle
	51		Cushion
	52		Felt
	53		Cord for speaker

9.2 SCHEMATIC DIAGRAM



10. FOR SD-T292/RD/Q, RD/Q1 AND SD-291/R/G TYPES

10.1 CONTRAST PARTS

NOTES :
- Parts without part number cannot be supplied.
- Parts marked by "◎" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).
560 Ω → 56 × 10¹ → 561 ………… RD1/4PS$\boxed{5}\boxed{6}\boxed{1}$J
47k Ω → 47 × 10³ → 473 ………… RD1/4PS$\boxed{4}\boxed{7}\boxed{3}$J
0.5 Ω → 0R5 ………… RN2H$\boxed{0}\boxed{R}\boxed{5}$K
1 Ω → 010 ………… RS1P$\boxed{0}\boxed{1}\boxed{0}$K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
5.62k Ω → 562 × 10¹ → 5621 ………… RN1/4SR$\boxed{5}\boxed{6}\boxed{2}\boxed{1}$F

10.1.1 CONTRAST OF MISCELLANEOUS PARTS

The SD-T292/RD/Q, RD/Q1 and SD-291/R/G types are the same as the SD-T292/RD/G type with the exception of the following sections.

Mark	Symbol & Description	Part No.				Remarks
		SD-T292 /RD/G type	SD-T292 /RD/Q type	SD-T292 /RD/Q1 type	SD-291 /R/G type	
	TV COMPLEX assembly	AWZ2494	AWZ2506	AWZ2501	AWZ2502	
	SW PHONE assembly	Non supply	Non supply	Non supply	Non supply	
	Y/C SYSTEM assembly	AWZ2496	AWZ2496	AWZ2496	AWZ2504	
	LED assembly	Non supply	Non supply	Non supply	Non supply	
	Upper carton	AHD1654	AHD1654	AHD1654	AHD1655	For packing
	Plug adapter	AKX1012	AKX1012	AKX1012	• • • • •	
	Front cabinet assembly	AMB1506	AMB1506	AMB1506	AMB1508	
	SP assembly	AMR2034	AMR2034	AMR2034	AMR2035	
	Operating instructions (English)	ARB1184	ARB1184	ARB1184	ARB1185	
	Operating instructions (Spanish)	ARC1160	ARC1160	ARC1160	• • • • •	
	Sub cover	AAN1134	AAN1134	AAN1134	AAN1135	Front cabinet assembly
	Control cover assembly	AMR1447	AMR1447	AMR1447	AMR1735	Front cabinet assembly
	Indicator panel	AAK1524	AAK1524	AAK1524	AMR1738	Front cabinet assembly
	Front baffle	AMR1730	AMR1730	AMR1730	AMR1731	SP assembly

10.1.2 TV COMPLEX ASSEMBLIES (AWZ2506 and AWZ2501)

The TV complex assemblies (AWZ2506 and AWZ2501) are the same as the TV complex assembly (AWZ2494) with the exception of the following sections.

Mark	Symbol & Description	Part No.			Remarks
		AWZ2494	AWZ2506	AWZ2501	
	C674	• • • • •	CCDSL470J50	CCDSL470J50	
	R671	RD1/8PM161J	RD1/8PM221J	RD1/8PM181J	
	R672	RD1/8PM680J	RD1/8PM181J	RD1/8PM121J	
	R714	• • • • •	RD1/8PM272J	RD1/8PM272J	

Note : For the schematic and P.C. boards diagrams, refer to pages 15 thru 36.

10.2 FOR SD-291/R/G TYPE

10.2.1 ELECTRICAL PARTS LIST

NOTES :
- Parts without part number cannot be supplied.
- Parts marked by "◎" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).
560 Ω → 56 × 10¹ → 561 ………… RD1/4PS$\boxed{5}\boxed{6}\boxed{1}$J
47k Ω → 47 × 10³ → 473 ………… RD1/4PS$\boxed{4}\boxed{7}\boxed{3}$J
0.5 Ω → 0R5 ………… RN2H$\boxed{0}\boxed{R}\boxed{5}$K
1 Ω → 010 ………… RS1P$\boxed{0}\boxed{1}\boxed{0}$K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
5.62k Ω → 562 × 10¹ → 5621 ………… RN1/4SR$\boxed{5}\boxed{6}\boxed{2}\boxed{1}$F

Y/C SYSTEM Assembly (AWZ2504)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC751	TDA4563
	Q753	2SA933S
	Q2,Q3,Q751,Q752,Q754 – Q756, Q762,Q764,Q810,Q811	2SC1740S
	D750	1SS252

COILS AND FILTERS

Mark	Symbol & Description	Part No.
	L751 Tuning coil	ATG1006
	L750	ATH1013
	L755	LAU120K
	L753	LAU150K
	L752	LAU330K
	L2	LAU680K
	L754	LAU8R2K
	F1,F810 Ceramic filter	ATF-166

CAPACITORS

Mark	Symbol & Description	Part No.
	C757	CCCCH101J50
	C754	CCCCH220J50
	C762	CCCCH560J50
	C760,C761,C779	CCCCH680J50
	C756,C777,C778	CCCCH820J50
	C780,C781	CCCSL101J50
	C759	CCCSL271J50
	C775,C776	CEAS010M50
	C758,C764	CEAS100M25
	C750,C753,C784	CEAS470M16
	C751,C763,C785	CKCYF103Z50
	C2,C3,C755,C818	CKDYF103Z50

RESISTORS

Mark	Symbol & Description	Part No.
	VR750 Semi-fixed (470Ω)	VRTB6VS471
	R823	RD1/4PM101J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	DL750 Delay line	ATN1011
	DL751,DL752 Delay line	ATN1012
	7P Jumper connector	KPC7

SW PHONE Assembly

SWITCHES

Mark	Symbol & Description	Part No.
	S980 – S985,S987,S988 Tact switch (ADD, ERASE, CHANNEL (+, –), VOLUME (+, –), PICTURE MEMORY, POWER ON & FUNCTION)	ASG1022
	S989 Slide switch (CHANNEL PLAN)	ASH1032

RESISTORS

Mark	Symbol & Description	Part No.
	R982,R983	RD1/2PM331J
	R980,R981	RD1/8PM222J

OTHERS

Mark	Symbol & Description	Part No.
	Headphone jack (PHONES)	AKN-049

TV COMPLEX Assembly (AWZ2502)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC201	CXK1008L
	IC600	CX20125
	IC400	M51321P
	IC12	M51365SP
	IC401	M5222L
	IC14	NJM7805A
	IC300	NJM7809A
	IC200	PD5085-A
	IC13	SBX1475-11
	IC402	TA8200AH
	IC601	TA8659AN
	IC403	TC4066BP
	IC11	TD6359P
	IC404	UPC7812H
	IC230	UPD6143C-001
	IC250	UPD6326C
	Q31	RN1201
	Q40	RN2203
	Q11 – Q13,Q18,Q22,Q27,Q400,Q601,Q602,Q606,Q607	2SA933S
	Q14,Q21,Q24,Q25,Q28 – Q30,Q37 – Q39,Q41,Q45,Q201,Q202,Q230,Q270,Q271,Q273,Q274,Q330,Q331,Q401 – Q411,Q600,Q603,Q605,Q609 – Q611	2SC1740S
	Q15 – Q17,Q23	2SC2668
	Q200	2SD438
	D403	RD2.7ESB2
	D201	RD3.3ESB2
	D33	RD30ESB2
	D407	RD5.1ESB3
	D200,D232,D330	RD5.6ESB2
	D412,D413	RD6.8ESB
	D604,D605	RD5.1ESB
	D610	RD7.5ESB2
	D601	RD9.1ESB
	D11,D31,D32,D202 – D204,D231,D400 – D402,D404 – D406,D410,D411,D414,D600,D602,D603	1SS252

SWITCH

Mark	Symbol & Description	Part No.
	S200 Slide switch (AFT)	ASH1009

COILS AND FILTERS

Mark	Symbol & Description	Part No.
	L22 Tuning coil	ATC-231
	L23 Tuning coil	ATC-250
	L25 Tuning coil	ATG1030
	L16 Tuning coil	ATG1031
	L400,L401 AF choke coil (1 μH)	ATH-133
	L602	LAU101K
	L19	LAU150K
	L28,L29,L31 – L35	LAU2R2M
	L603,L604	LAU270K
	L613	LAU4R7K
	L17,L18,L24	LAU5R6K
	L230	LAU560J
	L612	LAU560K
	L26,L600	LAU100K
	L601	LAU820K
	L27	LTA472J
	F13 Ceramic trap	ATF-114
	F11 SAW filter	ATF1020
	F17 Bandpass filter	ATF1021
	F19 Trap filter	ATF1051
	F18 Trap filter	ATF1052
	F12 Trap filter	ATF1053
	F20 Trap filter	ATF1063

CAPACITORS

Mark	Symbol & Description	Part No.
	C232,C669	CCCCH330J50
	C677	CCCCH560J50
	C676	CCCCH680J50
	C675	CCCCH820J50
	C238	CCCSL101J50
	C637	CCCSL271J50
	C610	CCCSL330J50
	C615,C665	CCCSL680J50
	C35,C36	CCDCH020C50
	C29 – C34	CCDCH030C50
	C55	CCDCH050C50
	C639	CCDCH150J50
	C233	CCDCH220J50
	C25,C78	CCDCH270J50
	C24	CCDCH330J50
	C54,C607	CCDCH390J50
	C608	CCDCH680J50
	C49	CCDRH270J50
	C47	CCDRH560J50
	C76,C86	CCDSL121J50
	C612	CCDSL221J50
	C84	CCDSL560J50
	C604	CCDSL390J50
	C20 – C22,C240	CCDSL470J50
	C80,C643	CEANP2R2M50
	C91,C92	CEANPR22M50
	C48,C65,C617,C653,C667	CEASR47M50
	C611	CEASR68M50
	C53,C79,C85,C203,C401,C402,C404,C405,C408,C606,C613,C621,C635,C652,C657	CEAS010M50
	C438,C440,C450,C600,C609,C623	CEAS100M25
	C60,C77,C83,C89,C109	CEAS100M50
	C27,C46,C72,C94,C101,C104,C409,C620,C660	CEAS101M16
	C432	CEAS101M35
	C618	CEAS6R8M50
	C410	CEAS102M10
	C631	CEAS101M10
	C436,C437	CEAS102M25
	C201	CEAS102M6
	C411 – C414,C416,C417,C421,C422	CEAS2R2M50
	C400,C403,C407,C602	CEAS220M25
	C26	CEAS220M50
	C14,C415,C423,C426	CEAS221M16
	C12	CEAS3R3M50
	C331,C443,C444,C601,C603,C622	CEAS4R7M50
	C28,C52,C64,C68,C88,C90,C200,C206,C208,C230,C250,C252,C406,C427,C428,C442	CEAS470M16
	C75	CEAS471M16
	C624 – C629,C632	CFTXA104J50
	C451,C452	CFTXA224J50
	C638	CFTXA394J50
	C96,C332	CFTXA474J50
	C435,C605,C654	CKCYB102K50
	C619,C630,C634,C642,C648,C649,C656	CKCYB103K50
	C270	CKCYB392K50
	C234 – C236,C616,C666	CKCYB471K50
	C614	CKCYB561K50
	C237	CKCYB681K50
	C202,C207,C209,C231,C251,C253,C330,C418,C431,C439,C441,C446	CKCYF103Z50
	C13,C18,C19,C58,C59,C66,C67,C73,C74,C93,C95,C102,C103	CKDYB102K50
	C11,C15,C23,C51,C56,C57,C61 – C63,C69,C70,C81,C87,C110,C333,C334	CKDYF103Z50
	C71	CKDYX473M25
	C429,C430	CQMA124K50
	C17	CQMA154K50
	C636	CQMA223K50
	C16	CQMA333K50
	C960	CQMA104J50
	C239	CQMA471J50
	C633	CQMA562K50
	C641	CQMA563K50
	C961	CQMA823K50

RESISTORS

Mark	Symbol & Description	Part No.
	VR11 Semi-fixed (4.7kΩ)	VRTB6VS472
	VR13 Semi-fixed (47kΩ)	VRTB6VS473
	VR600 Semi-fixed (100kΩ)	VRTS6VS104
	VR12 Semi-fixed (4.7kΩ)	VRTS6VS472
	R277,R423,R466,R467,R665	RD1/2PM□□□J
⚠	R24,R464,R465	RD1/4PMFL100J
⚠	R462,R463	RD1/4PMFL2R2J
⚠	R12,R94,R95	RD1/4PMF101J
	R343	RS1LMF150J
	R201,R202,R422	RS2LMF□□□J
	R71,R119	RD1/4PM□□□J
⚠	R40	RS2LMF680J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	X11 Crystal resonator (4.0MHz)	ASS-013
	X601 Crystal resonator (3.579545MHz)	ASS-028
	X600 Ceramic resonator (4.19MHz)	ASS1003
	X200 Ceramic resonator (4.0MHz)	ASS1025
	TV Front end	AXF1022
	Coaxial cable with pin plug	ADE1044
	11P pin jack	AKB1030
	4P speaker terminal	AKE1007
	4P mini DIN socket	AKP1017

LED Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	D961	AEL-460
	D960	AEL-463
	D963	AEL1003
	D964	1SS252

RESISTORS

Mark	Symbol & Description	Part No.
	R961	RD1/2PM561J
	R960	RD1/8PM151J

OTHERS

Mark	Symbol & Description	Part No.
	Remote control sensor unit	AXX1006

Note : The electrical parts list of other assemblies are the same as those of the SD-T292/RD/G type, refer to the section "5. ELECTRICAL PARTS LIST" (pages 9 thru 14).

10.2.2 SCHEMATIC DIAGRAM

1. RESISTORS :
Indicated in Ω, 1/4W, 1/6W and 1/8W, ±5% tolerance unless otherwise noted k ; kΩ, M ; MΩ, (F) ; ±1%, (G) ; ±2%, (K) ; ±10%, (M) ; ±20% tolerance.

2. CAPACITORS :
Indicated in capacity (μF)/voltage (V) unless otherwise noted p ; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT :
▭ ; DC voltage (V) at color bar signal input.
Value in ( ) is DC voltage at rated power.
⇐mA ; DC current at color bar signal input.

4. OTHERS :
⊘ ; Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

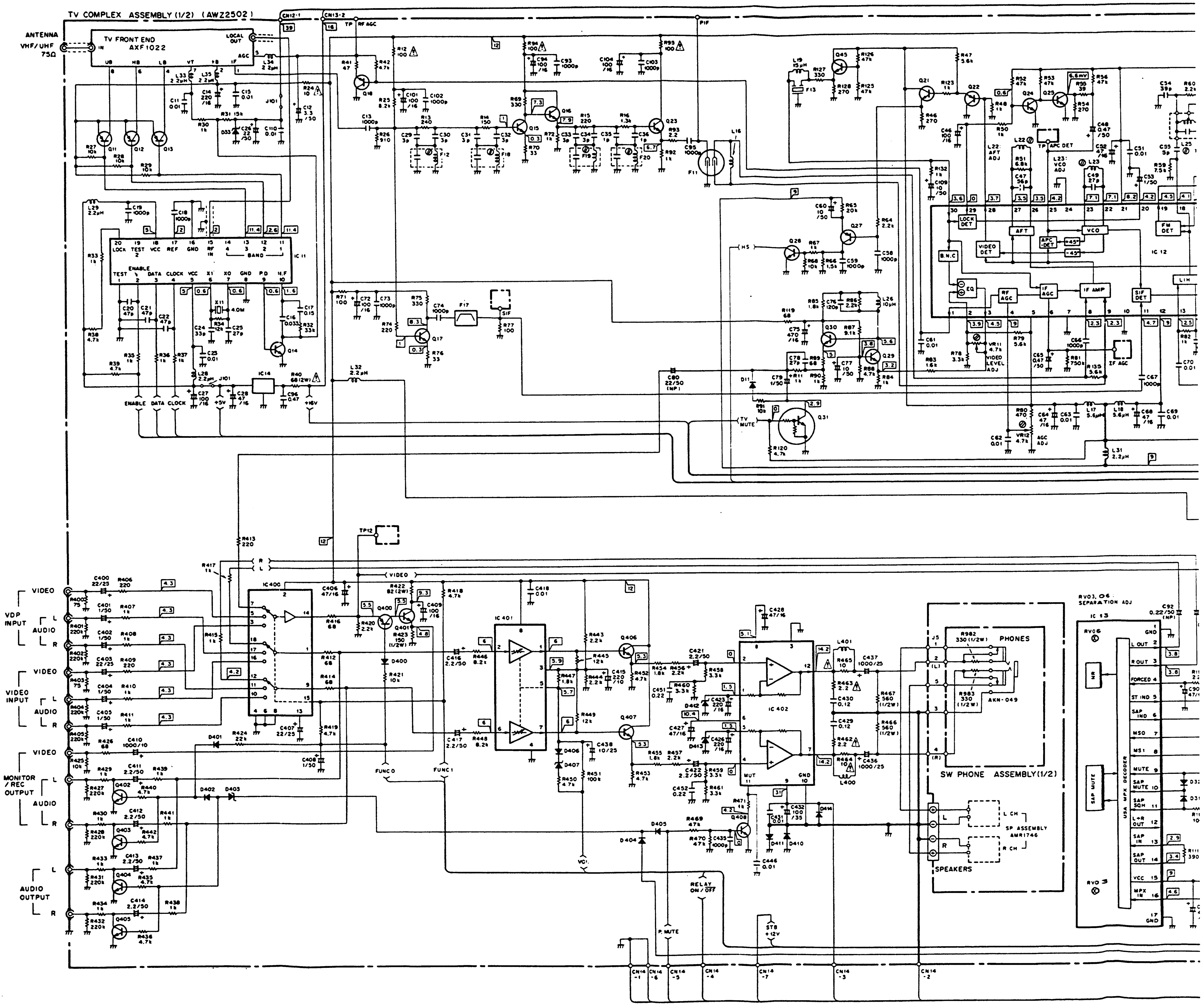
5. ☆ mark : important parts related with X–RAY radiation.
▨ : CHARGED SECTION

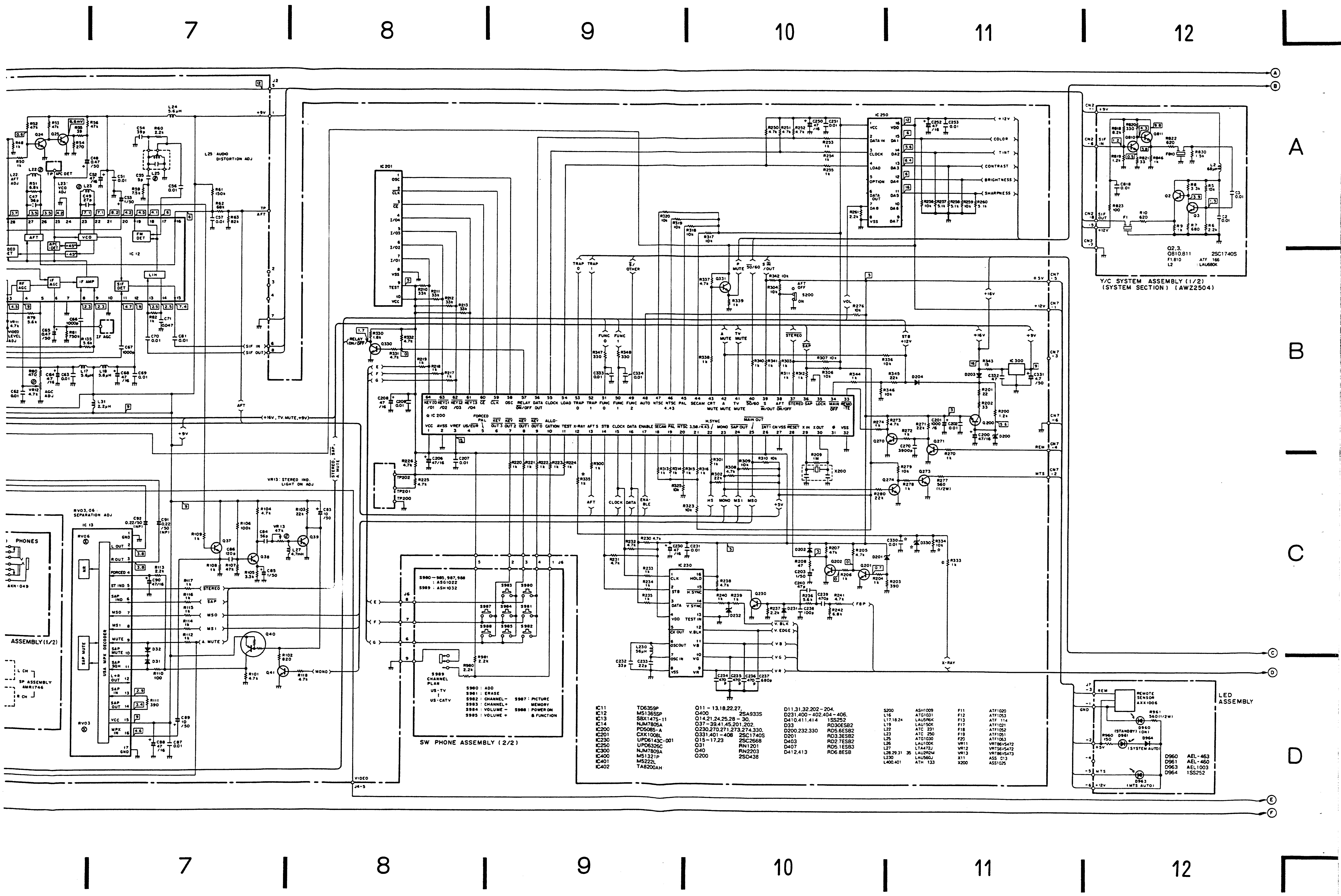
6. SWITCHES : (The underlined indicates the switch position)
POWER SWITCH ASSEMBLY
S950 : MAIN POWER ON — OFF

SW, PHONE ASSEMBLY
S980 : ADD
S981 : ERASE
S982 : CHANNEL −
S983 : CHANNEL +
S984 : VOLUME −
S985 : VOLUME +
S987 : PICTURE MEMORY
S988 : POWER ON & FUNCTION
S989 : CHANNEL PLAN
US–TV — US–CATV

TV COMPLEX ASSEMBLY
S200 : AFT ON — OFF

OUTSIDE OF P.C. BOARDS
S1 : VOLTAGE SELECTOR 110V – 127V/220V – 240V


TV COMPLEX ASSEMBLY (1/2) (AWZ2502)
ANTENNA
VHF/UHF 75Ω
TV FRONT END AXF1022
LOCAL OUT
AGC
IC11
IC12
IC14
ENABLE
DATA
CLOCK
+5V
+16V
PIF
SIF
AFT
VCO
APC DET
VIDEO DET
IF AMP
RF AGC
FM DET
LOCK DET
TV MUTE
VIDEO
VDP INPUT
AUDIO
VIDEO INPUT
MONITOR /REC OUTPUT
AUDIO OUTPUT
IC400
IC401
IC402
FUNC 0
FUNC 1
RELAY ON/OFF
P.MUTE
STB +12V
PHONES
AKN-049
SW PHONE ASSEMBLY (1/2)
SP ASSEMBLY AMR1746
L CH
R CH
SPEAKERS
RV03, 06 SEPARATION ADJ
IC 13
RV06
RV03
MPX DECODER
SAP MUTE
CN14

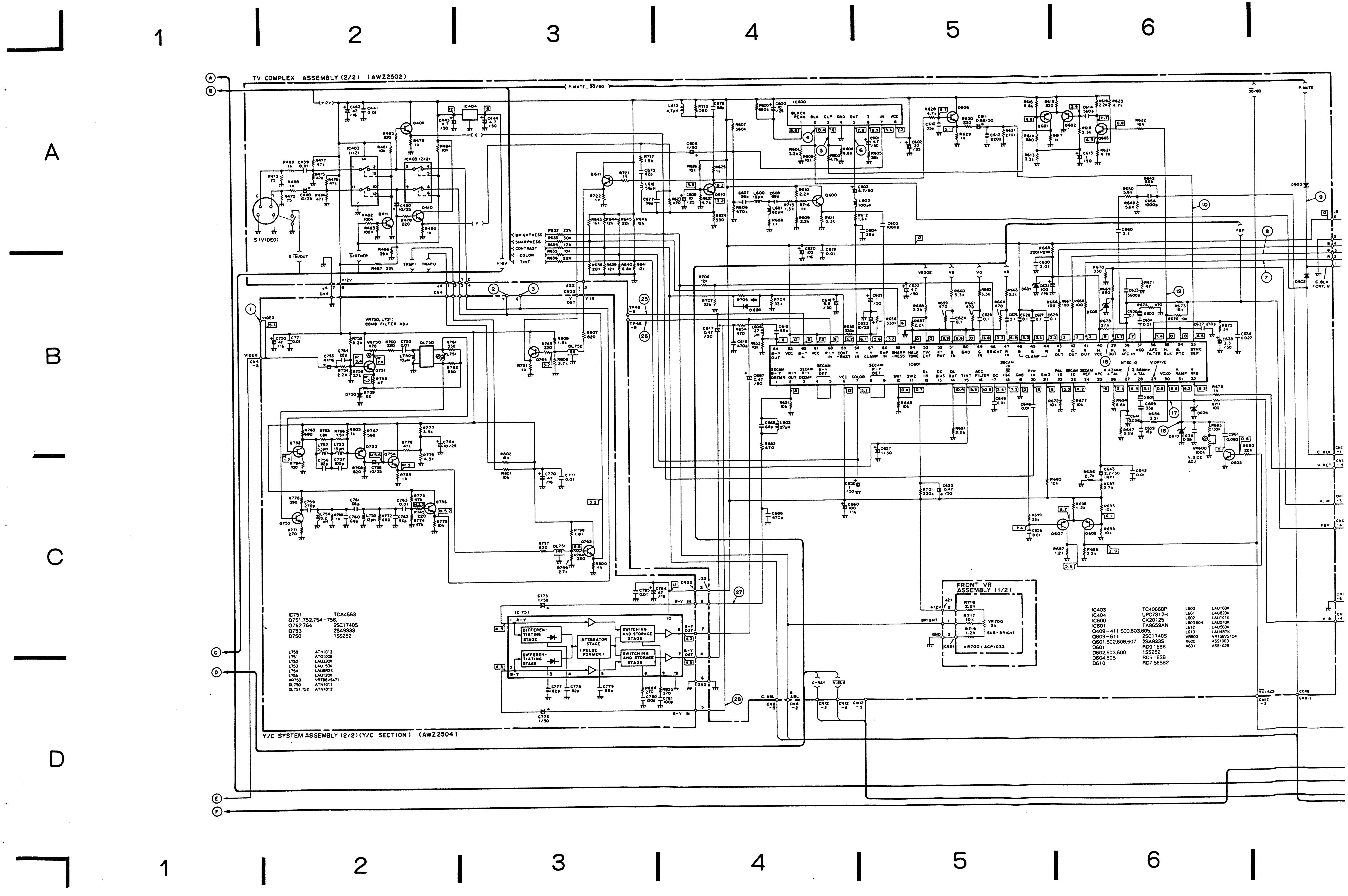

7
8
9
10
11
12
A
B
C
D
IC 12
IC 13
IC 200
IC 201
IC 230
IC 250
IC 300
L25: AUDIO DISTORTION ADJ
VR13: STEREO IND. LIGHT ON ADJ
RV03, 06: SEPARATION ADJ
USA MPX DECODER
PHONES
ASSEMBLY (1/2)
SP ASSEMBLY AMR1746
SIF IN
SIF OUT
AFT
(+16V, TV.MUTE, +9V)
STEREO, SAP, A.MUTE
STEREO
SAP
MSO
MSI
A. MUTE
MONO
VIDEO
J4-5
RELAY ON/OFF
TRAP 0
TRAP 1
S/OTHER
MUTE
50/60
S/OUT
AFT OFF
S200
VOL
FUNC 0
FUNC 1
A MUTE
TV MUTE
STEREO
SAP
STB +12V
+16V
+9V
+5V
+12V
COLOR
TINT
CONTRAST
BRIGHTNESS
SHARPNESS
REM
MTS
CLOCK
DATA
ENA-BLE
HS
MONO
MSI
MSO
FBP
V. BLK
V. EDGE
VB
VG
VR
X-RAY
TP200
TP201
TP202
X200
CN2
CN7
J2
J6
J7
SW PHONE ASSEMBLY (2/2)
S980–985, 987, 988 : ASG1022
S989 : ASH1032
S989 CHANNEL PLAN
US-TV
US-CATV
S980 : ADD
S981 : ERASE
S982 : CHANNEL−
S983 : CHANNEL+
S984 : VOLUME −
S985 : VOLUME +
S987 : PICTURE MEMORY
S988 : POWER ON & FUNCTION
Y/C SYSTEM ASSEMBLY (1/2)
(SYSTEM SECTION) (AWZ2504)
Q2.3.
Q810.811 2SC1740S
F1.810 ATF 166
L2 : LAU680K
LED ASSEMBLY
REMOTE SENSOR AXX1006
R961 560(1/2W)
D960 (ON)
(STANDBY) D961
R960 150
D964
(SYSTEM AUTO)
D963 (MTS AUTO)
GND
D960 AEL-463
D961 AEL-460
D963 AEL1003
D964 1SS252
A
B
C
D
E
F

IC11	TD6359P
IC12	M51365SP
IC13	SBX1475-11
IC14	NJM7805A
IC200	PD5085-A
IC201	CXK1008L
IC230	UPD6143C-001
IC250	UPD6326C
IC300	NJM7809A
IC400	M51321P
IC401	M5222L
IC402	TA8200AH

Q11 – 13.18.22.27. Q400	2SA933S
Q14.21.24.25.28 – 30. Q37 – 39.41.45.201.202. Q230.270.271.273.274.330. Q331.401 – 408	2SC1740S
Q15 – 17.23	2SC2668
Q31	RN1201
Q40	RN2203
Q200	2SD438

D11.31.32.202 – 204. D231.400 – 402.404 – 406. D410.411.414	1SS252
D33	RD30ESB2
D200.232.330	RD5.6ESB2
D201	RD3.3ESB2
D403	RD2.7ESB2
D407	RD5.1ESB3
D412.413	RD6.8ESB

S200	ASH1009	F11	ATF1020
L16	ATG1031	F12	ATF1053
L17.18.24	LAU5R6K	F13	ATF 114
L19	LAU150K	F17	ATF1021
L22	ATC 231	F18	ATF1052
L23	ATC 250	F19	ATF1051
L25	ATG1030	F20	ATF1063
L26	LAU100K	VR11	VRTB6VS472
L27	LTA472J	VR12	VRTS6VS472
L28.29.31 35	LAU2R2M	VR13	VRTB6VS473
L230	LAU560J	X11	ASS C13
L400.401	ATH 133	X200	ASS1025

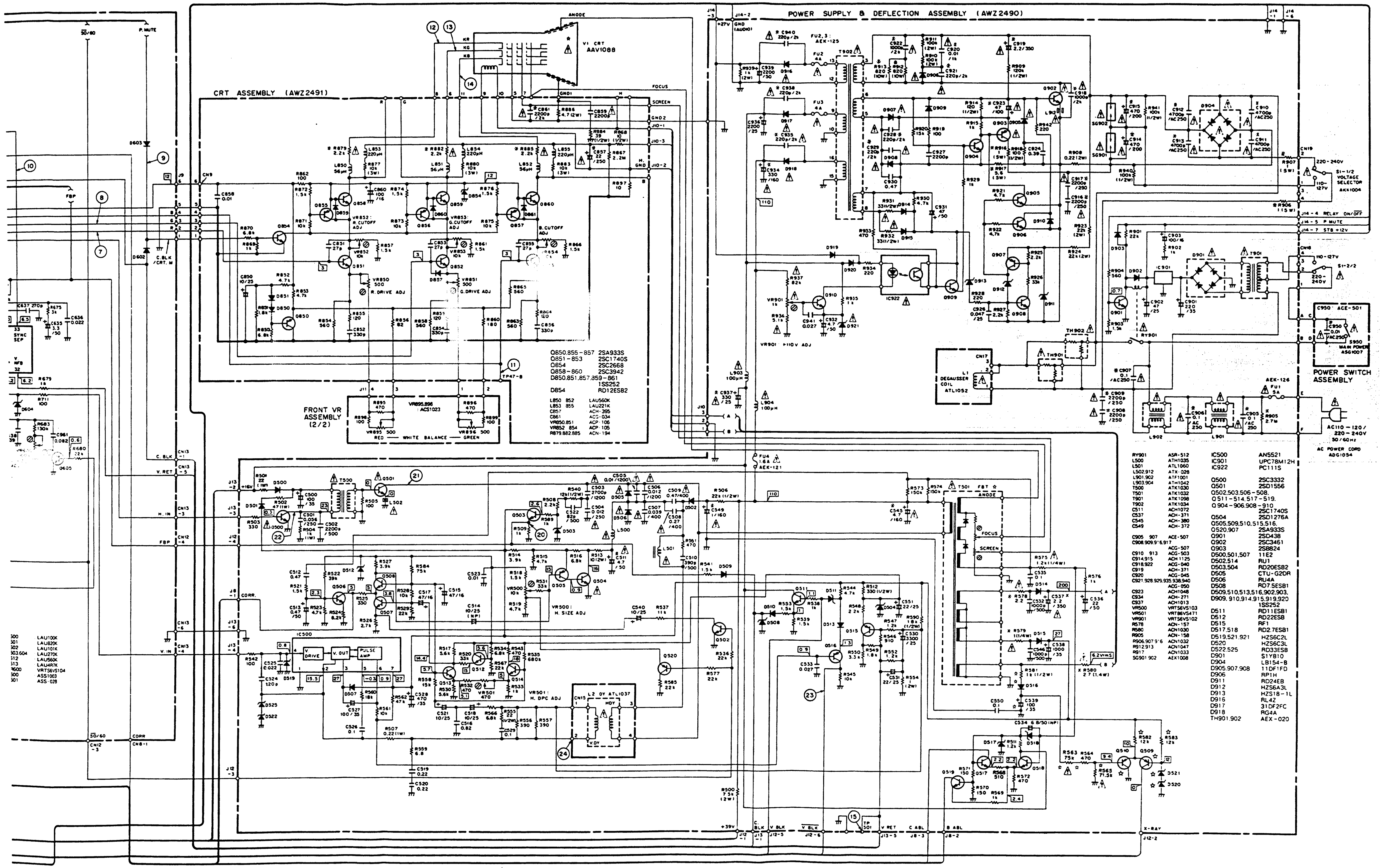

TV COMPLEX ASSEMBLY (2/2) (AWZ2502)
Y/C SYSTEM ASSEMBLY (2/2)(Y/C SECTION) (AWZ2504)
FRONT VR ASSEMBLY (1/2)
VR700 : ACP1033
VR700 5k SUB-BRIGHT
IC751
DIFFEREN-TIATING STAGE
INTEGRATOR STAGE (PULSE FORMER)
SWITCHING AND STORAGE STAGE
IC600
IC601
IC403 (1/2)
IC403 (2/2)
IC404
S (VIDEO)
S IN/OUT
VR750, L751: COMB FILTER ADJ
P. MUTE, 50/60
BRIGHTNESS
SHARPNESS
CONTRAST
COLOR
TINT
V. SIZE ADJ
C. BLK
V. RET
H. IN
FBP
V. IN
X-RAY
V. BLK
C. ABL
B ABL
1
2
3
4
5
6
A
B
C
D
E
F

IC751	TDA4563
Q751.752.754-756.	
Q762.764	2SC1740S
Q753	2SA933S
D750	1SS252

L750	ATH1013
L751	ATG1006
L752	LAU330K
L753	LAU150K
L754	LAU8R2K
L755	LAU120K
VR750	VRTB6VS471
DL750	ATN1011
DL751.752	ATN1012

IC403	TC4066BP
IC404	UPC7812H
IC600	CX20125
IC601	TA8659AN
Q409-411.600.603.605.	
Q609-611	2SC1740S
Q601.602.606.607	2SA933S
D601	RD9.1ESB
D602.603.600	1SS252
D604.605	RD5.1ESB
D610	RD7.5ESB2

L600	LAU100K
L601	LAU820K
L602	LAU101K
L603.604	LAU270K
L612	LAU560K
L613	LAU4R7K
VR600	VRTS6VS104
X600	ASS1003
X601	ASS-028


CRT ASSEMBLY (AWZ2491)
POWER SUPPLY & DEFLECTION ASSEMBLY (AWZ2490)
FRONT VR ASSEMBLY (2/2)
POWER SWITCH ASSEMBLY
V1 CRT AAV1088
ANODE
FOCUS
SCREEN
VR852: R.CUTOFF ADJ
VR853: G.CUTOFF ADJ
B.CUTOFF ADJ
VR850 500 R.DRIVE ADJ
VR851 500 G.DRIVE ADJ
VR895.896 ACS1023
RED — WHITE BALANCE — GREEN
VR500: H. SIZE ADJ
VR501: H. DPC ADJ
VR901 110V ADJ
IC500
V DRIVE
V. OUT
PULSE AMP
IC901
IC922
T500
T501 FBT
T901
T902
L2 DY ATL1037
HDY
VDY
L1 DEGAUSSER COIL ATL1052
FU2,3: AEK-125
FU4 1.6A AEK-121
FU1 5A AEK-126
S1-1/2 VOLTAGE SELECTOR AEK1004
S1-2/2
220-240V
110-127V
S950 MAIN POWER ASG1007
C950 ACE-501
AC110-120/220-240V 50/60Hz
AC POWER CORD ADG1054
J14-4 RELAY ON/OFF
J14-5 P.MUTE
J14-7 STB +12V
C.BLK
V.RET
H.IN
FBP
CORR
V.IN
P.MUTE
50/60
C.BLK/CRT.M
SYNC SEP
+39V
V BLK
V RET
C ABL
B ABL
X-RAY
TP47-8
TP501

500	LAU100K
501	LAU820K
502	LAU101K
503.604	LAU270K
512	LAU560K
513	LAU4R7K
R600	VRTS6VS104
500	ASS1003
501	ASS-028

Q850.855-857	2SA933S
Q851-853	2SC1740S
Q854	2SC2668
Q858-860	2SC3942
D850.851.857.859-861	1SS252
D854	RD12ESB2

L850 852	LAU560K
L853 855	LAU221K
C857	ACH-395
C861	ACG-034
VR850.851	ACP-106
VR852 854	ACP-105
R879.882.885	ACN-194

RY901	ASR-512
L500	ATH1035
L501	ATL1060
L502.912	ATX-028
L901.902	ATF1001
L903.904	ATH1042
T500	ATK1030
T501	ATK1032
T901	ATK1098
T902	ATK1034
C511	ACH1072
C537	ACH-371
C545	ACH-380
C549	ACH-372
C905 907	ACE-507
C908.909.916.917	ACG-507
C910 913	ACG-503
C914.915	ACH 1125
C918.922	ACG-040
C919	ACH-371
C920	ACG-045
C921.928.929.935.938.940	ACG-050
C923	ACH1048
C934	ACH-271
C937	ACH1013
VR500	VRTS6VS103
VR501	VRTB6VS471
VR901	VRTS6VS102
R578	ACN-157
R580	ACN1030
R905	ACN-158
R906.907 916	ACN1032
R912.913	ACN1047
R917	ACN1033
SG901 902	AEX1008

IC500	AN5521
IC901	UPC78M12H
IC922	PC111S
Q500	2SC3332
Q501	2SD1556
Q502.503.506-508. Q511-514.517-519. Q904-906.908-910	2SC1740S
Q504	2SD1276A
Q505.509.510.515.516. Q520.907	2SA933S
Q901	2SD438
Q902	2SC3461
Q903	2SB824
D500.501.507	11E2
D502.514	RU1
D503.504	RD20ESB2
D505	CTU-G2DR
D506	RU4A
D508	RD7.5ESB1
D509.510.513.516.902.903. D909.910.914.915.919.920	1SS252
D511	RD11ESB1
D512	RD22ESB
D515	RF1
D517.518	RD2.7ESB1
D519.521.921	HZS6C2L
D520	HZS6C3L
D522.525	RD33ESB
D901	S1YB10
D904	LB154-B
D905.907.908	11DF1FD
D906	RP1H
D911	RD24EB
D912	HZS6A3L
D913	HZS18-1L
D916	RL4Z
D917	31DF2FC
D918	RG4A
TH901.902	AEX-020

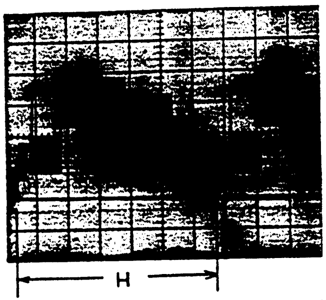
A
B
C
D

The waveforms at each position

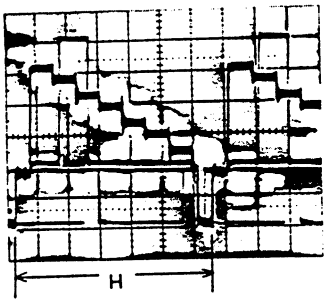
Condition

- Input : NTSC color bar VDP input
- Picture quality : STD
- No input audio signal
- AC range
- H rate (without notice)
- H = 63.6μsec (15.75kHz)
- V = 16.7msec (60Hz)

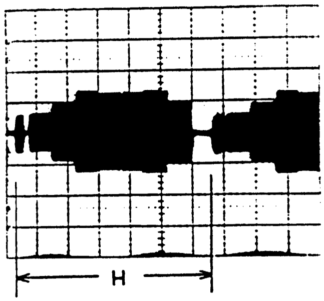
① TP-VIDEO
H : 10μsec/div
V : 500mV/div



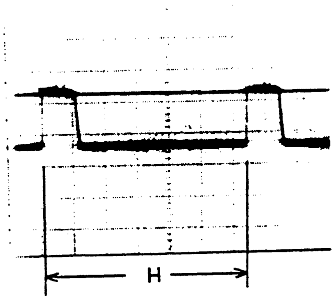
② TP Y
H : 10μsec/div
V : 200mV/div



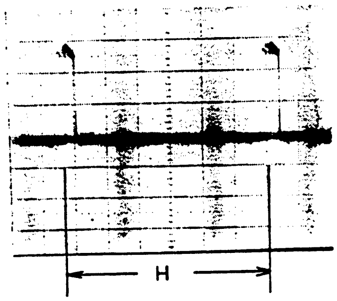
③ TP C
H : 10μsec/div
V : 100mV/div



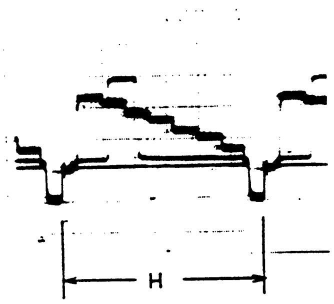
④ IC600 pin 2
H : 10μsec/div
V : 1V/div



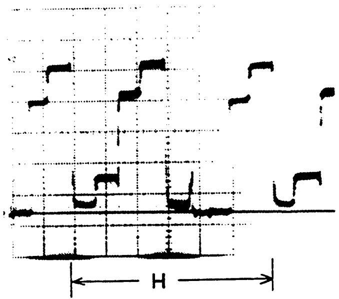
⑤ IC600 pin 3
H : 10μsec/div
V : 1V/div



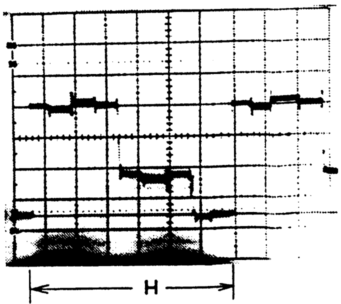
⑥ IC600 pin 5
H : 10μsec/div
V : 200mV/div



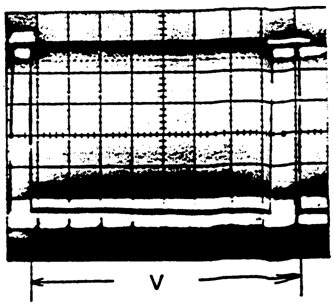
⑦ J9 pin 2 (R out)
H : 10μsec/div
V : 1V/div



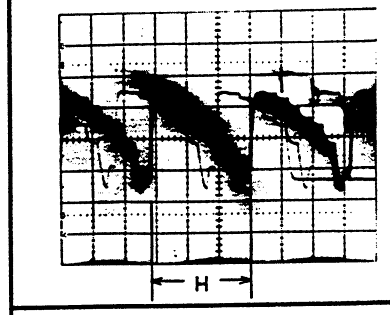
⑧ J9 pin 3 (G out)
H : 10μsec/div
V : 1V/div



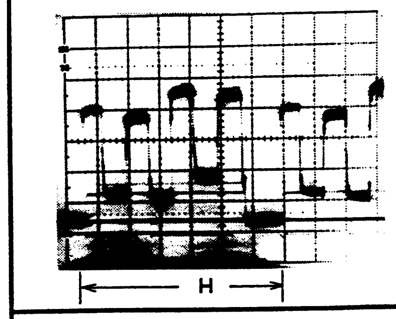
⑨ J9 pin 1 (C. BLK/MUTE)
V rate H : 2msec/div
V : 1V/div



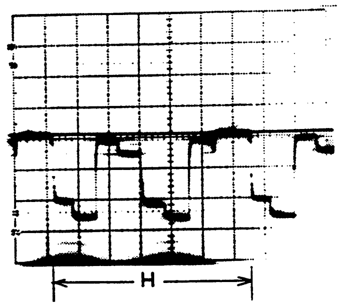
⑩ IC601 pin 33
H : 20μsec/div
V : 500mV/div



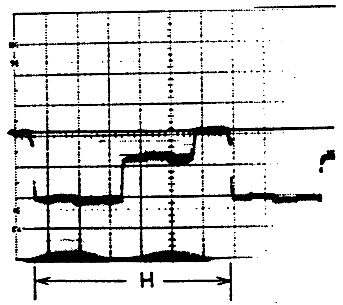
⑪ TP47 – B
H : 10μsec/div
V : 1V/div



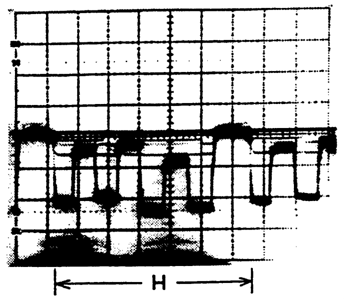
⑫ CRT socket pin 8 (Cathode R)
H : 10μsec/div
V : 50V/div



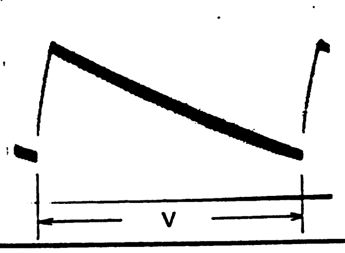
⑬ CRT socket pin 6 (Cathode G)
H : 10μsec/div
V : 50V/div



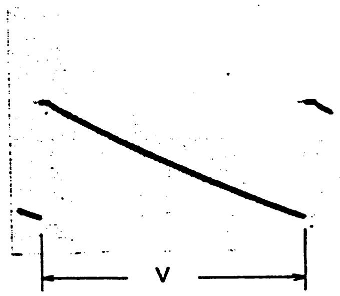
⑭ CRT socket pin 11 (Cathode B)
H : 10μsec/div
V : 50V/div



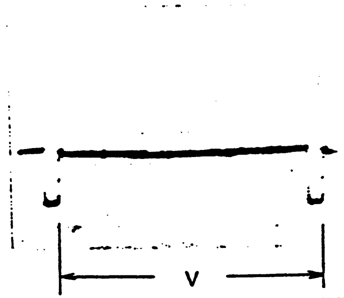
⑮ TP501 (V. RET)
V rate H : 2msec/div
V : 500mV/div



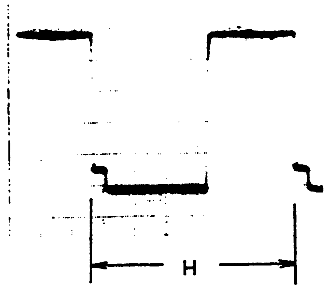
⑯ IC601 pin 31
V rate H : 2msec/div
V : 500mV/div



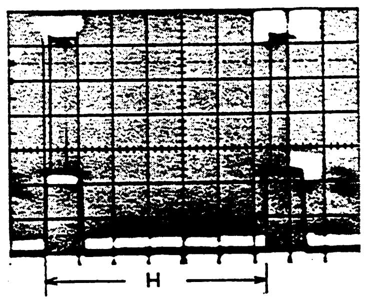
⑰ IC601 pin 29
V rate H : 2msec/div
V : 500mV/div



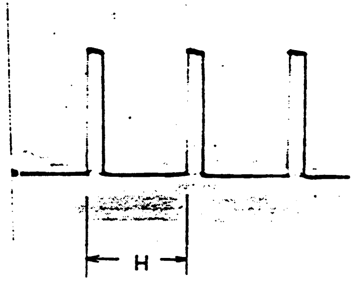
⑱ IC601 pin 39
H : 10μsec/div
V : 1V/div



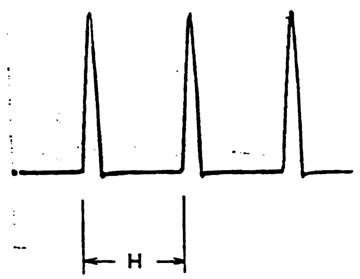
⑲ IC601 pin 35
H : 10μsec/div
V : 2V/div



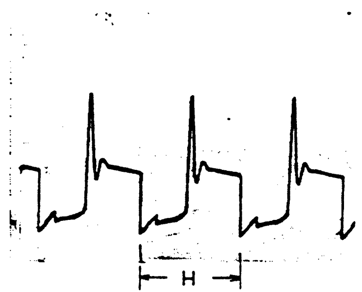
⑳ Q503 emitter
H : 20μsec/div
V : 5V/div



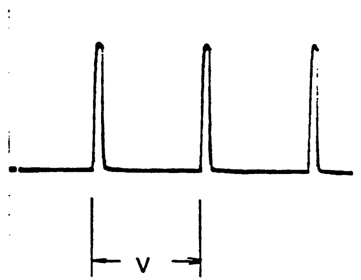
㉑ Q501 collector
H : 20μsec/div
V : 200V/div



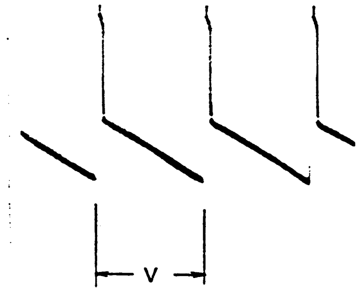
㉒ Q500 collector
H : 20μsec/div
V : 20V/div



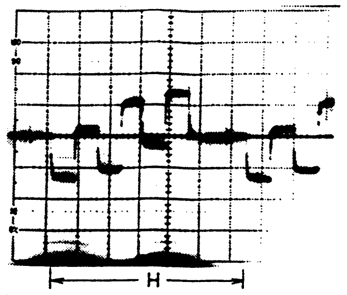
㉓ Q516 collector
V rate H : 5msec/div
V : 5V/div



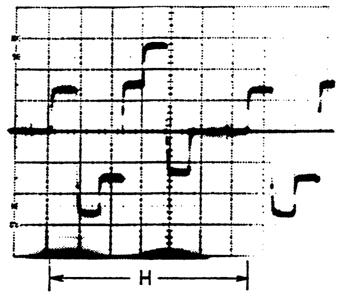
㉔ DY pin 2 (V OUT)
V rate H : 5msec/div
V : 10V/div



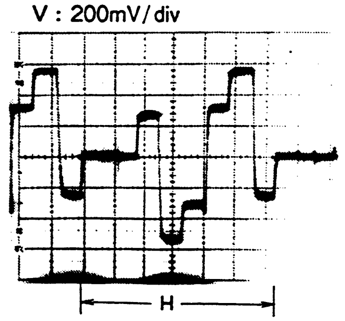
㉕ TP46 – B
H : 10μsec/div
V : 200mV/div



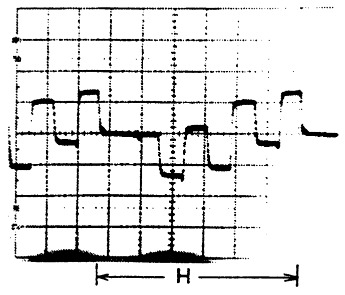
㉖ TP46 – R
H : 10μsec/div
V : 200mV/div



㉗ J22 Pin 8
H : 10μsec/div
V : 200mV/div



㉘ J22 Pin 5
H : 10μsec/div
V : 200mV/div



10.2.3 P.C.BOARDS PATTERN

NOTE

1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

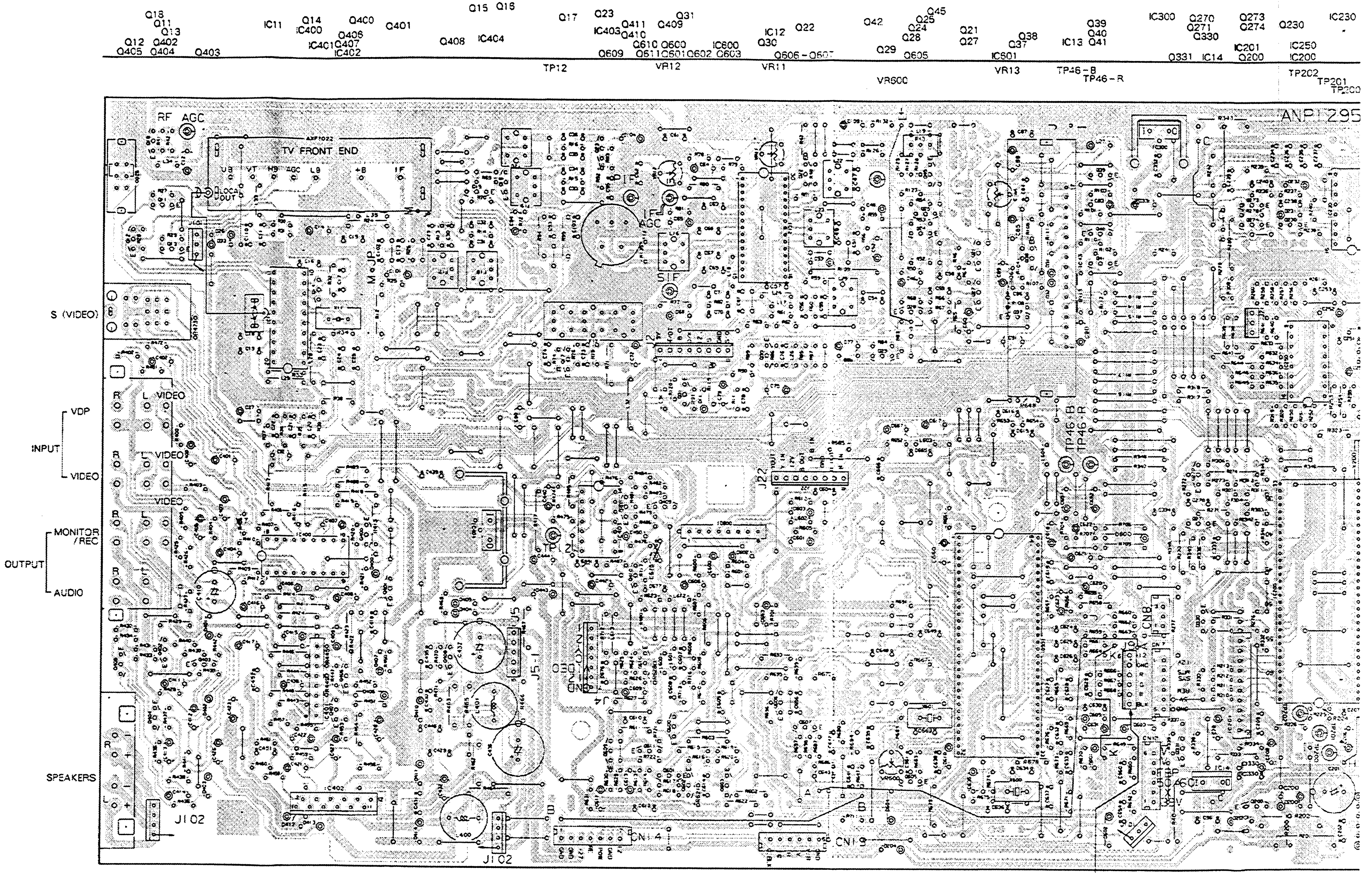
P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
E 0504	E or E	Transistor
0215	or	Radiator type transistor
0203	D203	Diode
R237	R237	Resistor
C513	+	Capacitor (Polarity)
C518		Capacitor (Non-polarity)

Others

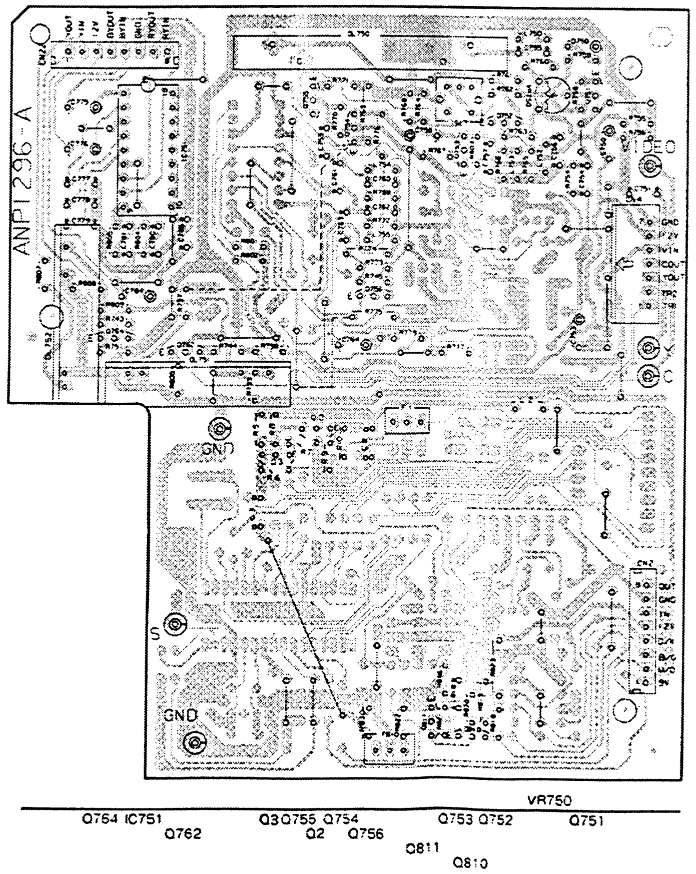
P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

3. The capacitor terminal marked with ◎ (double circles) shows negative terminal.
4. The diode terminal marked with ◎ (double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

TV COMPLEX ASSEMBLY (AWZ2502)

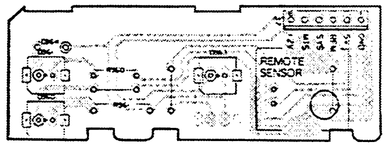

Q18
Q11
Q13
Q12 Q402
Q4C5 Q404
Q403
IC11
Q14
IC400
IC401 Q407
Q406
IC402
Q4C0
Q401
Q408
IC404
Q15 Q16
Q17
TP12
Q23
IC403
Q411
Q410
Q409
Q31
Q610 Q600
Q609 Q611 Q601 Q602 Q603
IC600
VR12
IC12
Q30
Q22
Q606 - Q607
VR11
Q42
Q29
Q45
Q25
Q24
Q28
Q605
VR600
Q21
Q27
Q38
Q37
IC601
VR13
IC13
Q39
Q40
Q41
TP46 - B
TP46 - R
IC300
Q270
Q271
Q330
Q331
IC14
Q273
Q274
IC201
Q200
Q230
IC250
IC200
IC230
TP202
TP201
TP200
RF AGC
TV FRONT END
AGC
S.I.F
ANP1295
S (VIDEO)
INPUT
VDP
VIDEO
OUTPUT
MONITOR /REC
AUDIO
SPEAKERS
J22
J102
CN14
CN13
CN8
TP46-B
TP46-R

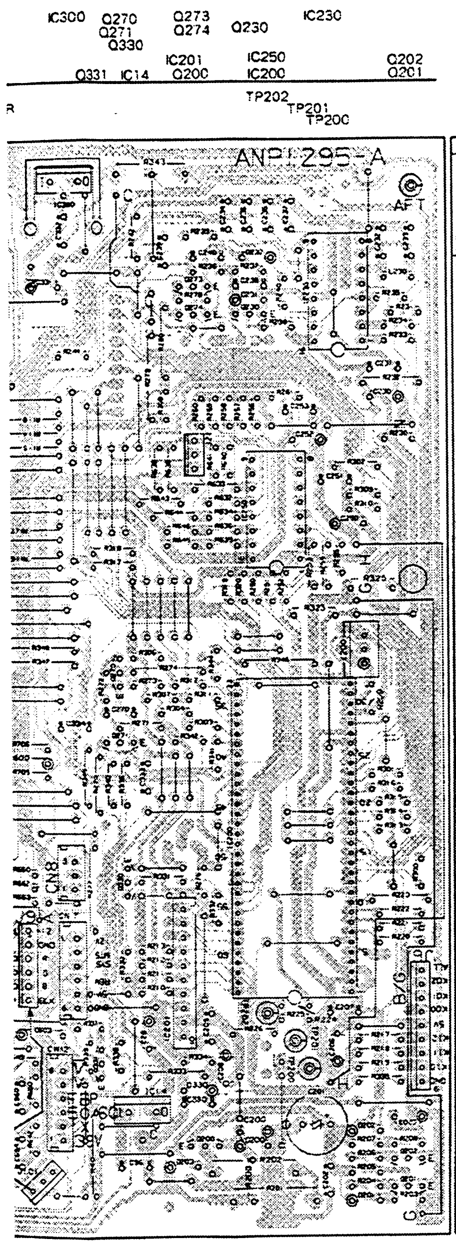
Note : "B" and "R" indications marked
of J9 should be read "R" and "B"


ANP1296-A
GND
S
GND
VR750
Q764 IC751
Q762
Q3 Q755 Q754
Q2 Q756
Q811
Q810
Q753 Q752
Q751

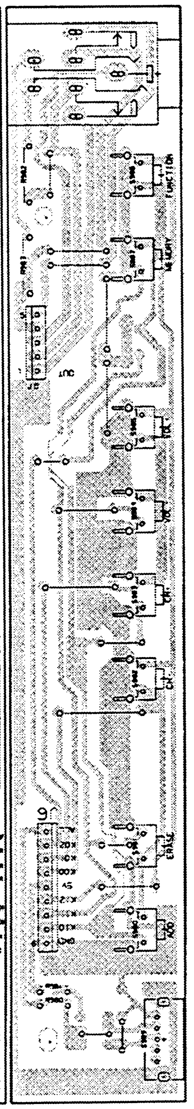
Y/C SYSTEM ASSEMBLY
(AWZ2504)

LED ASSEMBLY


REMOTE SENSOR

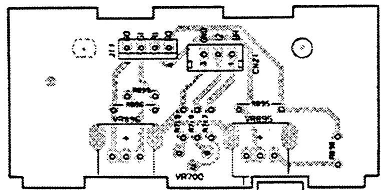

IC300 Q270 Q271 Q330 Q273 Q274 Q230 IC230
Q331 IC14 IC201 Q200 IC250 IC200 Q202 Q201
TP202 TP201 TP200
R
ANP1295-A
AFT

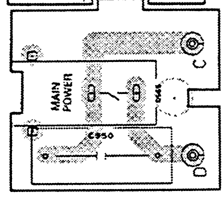
SW PHONE ASSEMBLY



" and "R" indications marked on pin 2 and pin 4
should be read "R" and "B" respectively.

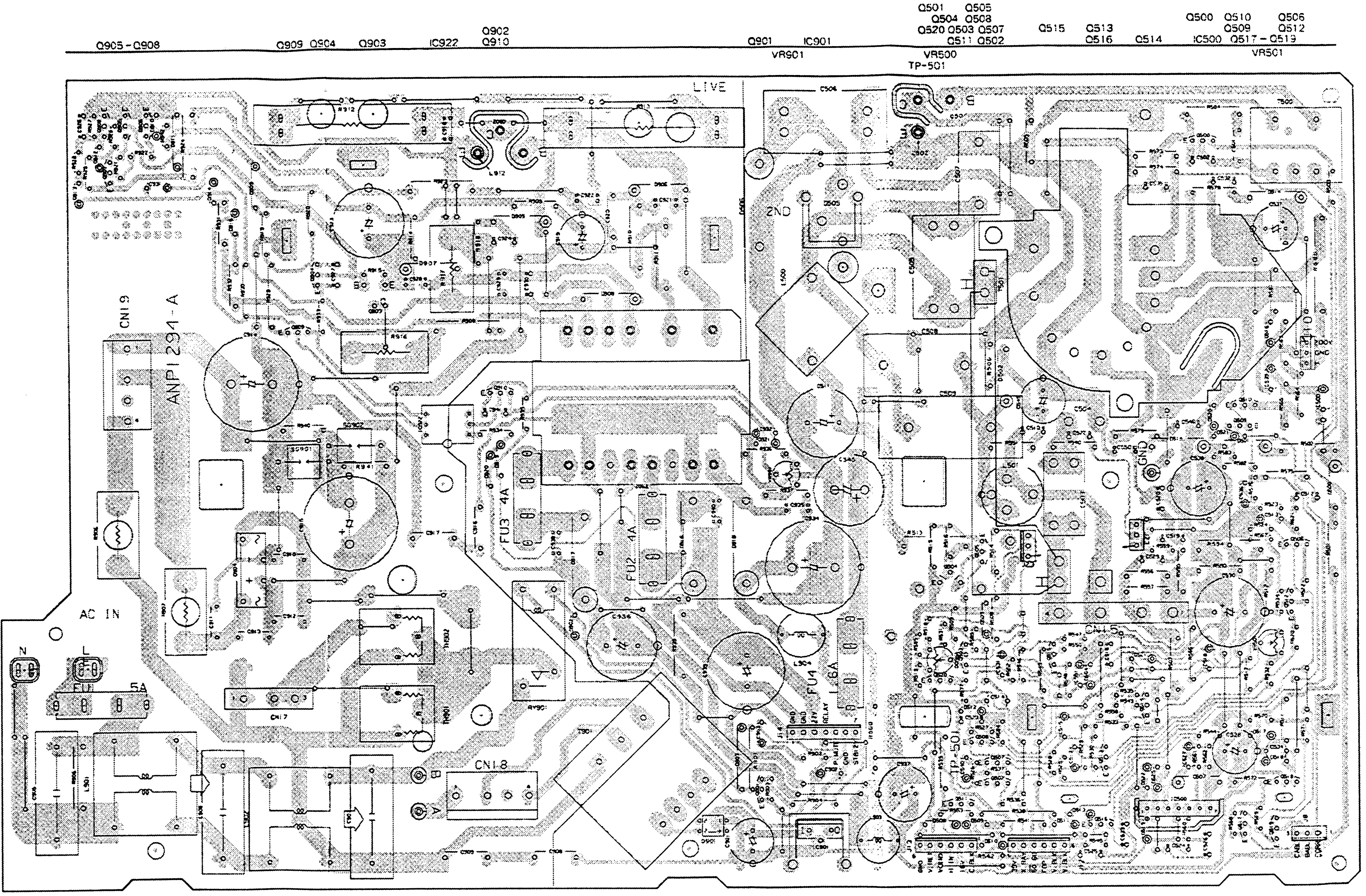
FRONT VR ASSEMBLY



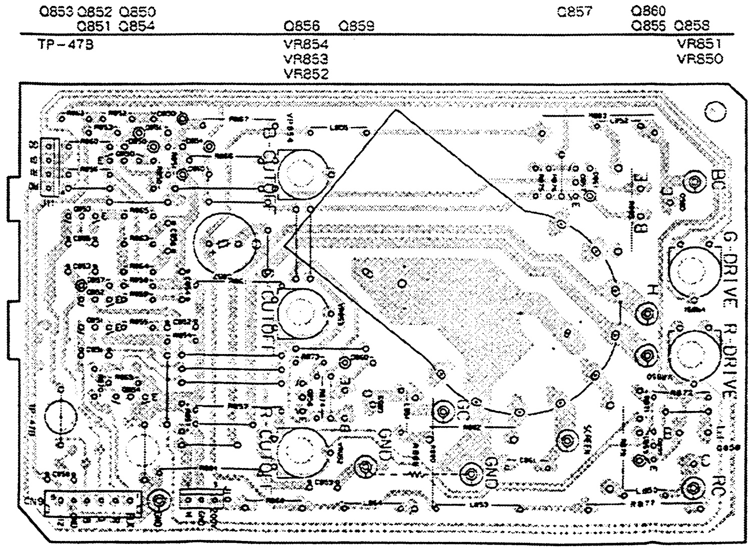

MAIN POWER
C950

POWER SWITCH ASSEMBLY

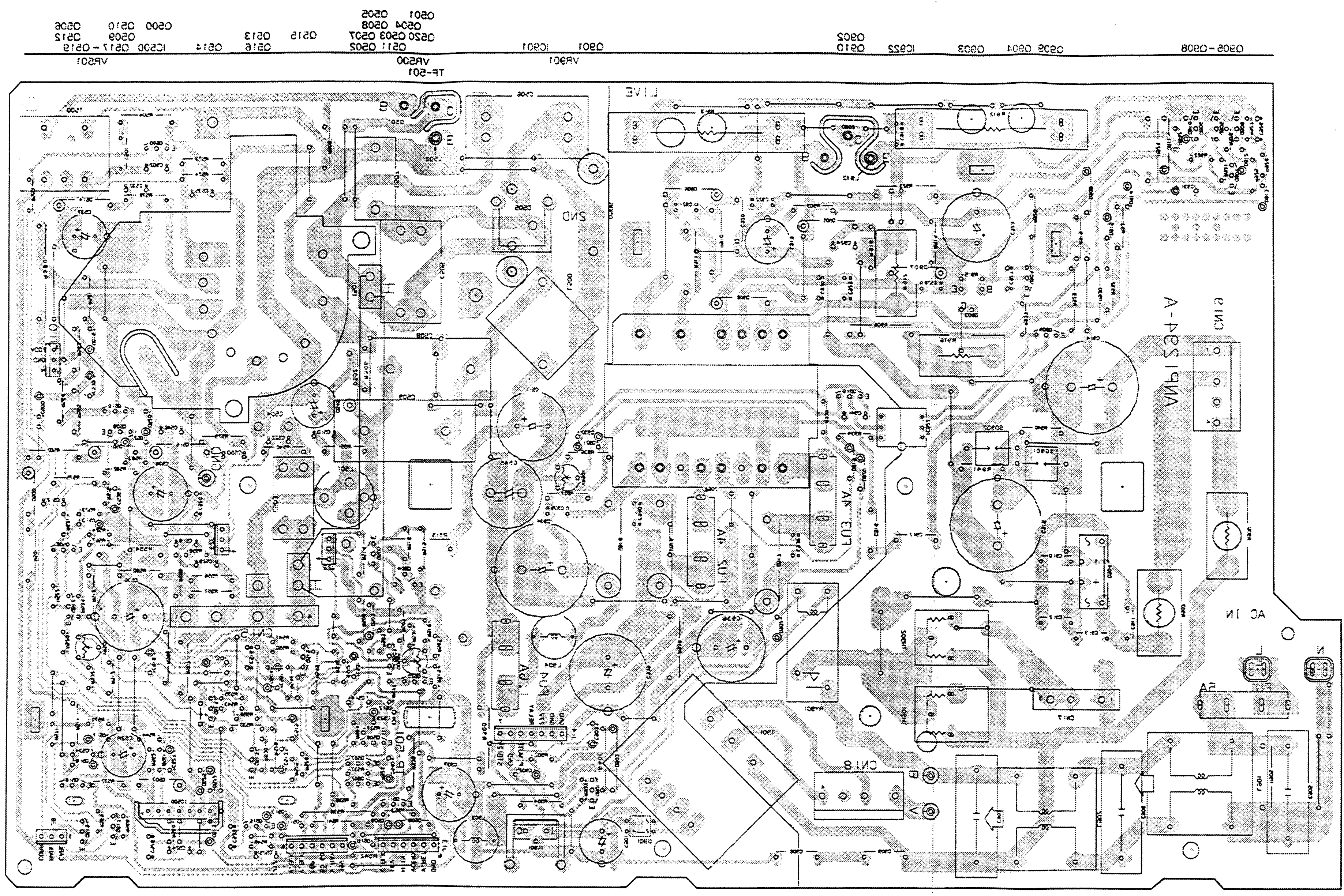
POWER SUPPLY & DEFLECTION ASSEMBLY (AWZ2490)


Q905 - Q908
Q909 Q904 Q903 IC922 Q902 Q910
Q901 IC901 VR901
Q501 Q505 Q504 Q508 Q520 Q503 Q507 Q511 Q502
VR500 TP-501
Q515 Q513 Q516 Q514
Q500 Q510 Q506 Q509 Q512 IC500 Q517 - Q519
VR501
LIVE
CN19
ANP1291-A
AC IN
N
L
5A
FU3 4A
FU2 4A
FU4 1.6A
CN18
TP-501

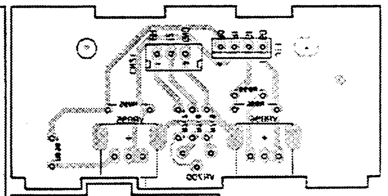
CRT ASSEMBLY
(AWZ2491)

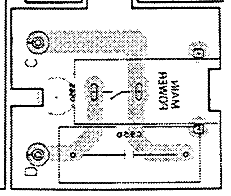

Q853 Q852 Q850 Q851 Q854
TP-47B
Q856 Q859
VR854 VR853 VR252
Q857
Q860 Q855 Q858
VR851 VR850
G-CUTOFF
B-CUTOFF
R-CUTOFF
BC
G-DRIVE
R-DRIVE
GND
RC

POWER SUPPLY & DEFLECTION ASSEMBLY (AWZ2490)


LIVE
AC IN
CN8
CN19
ANP1294-A

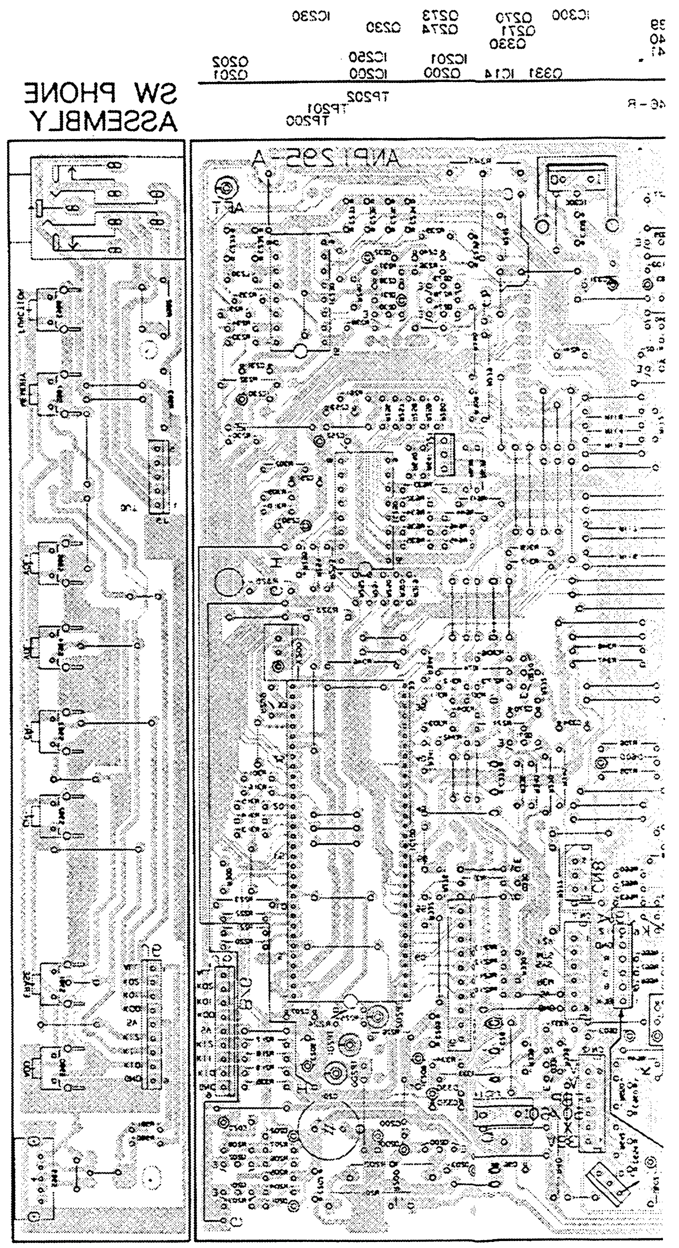
FRONT VR ASSEMBLY



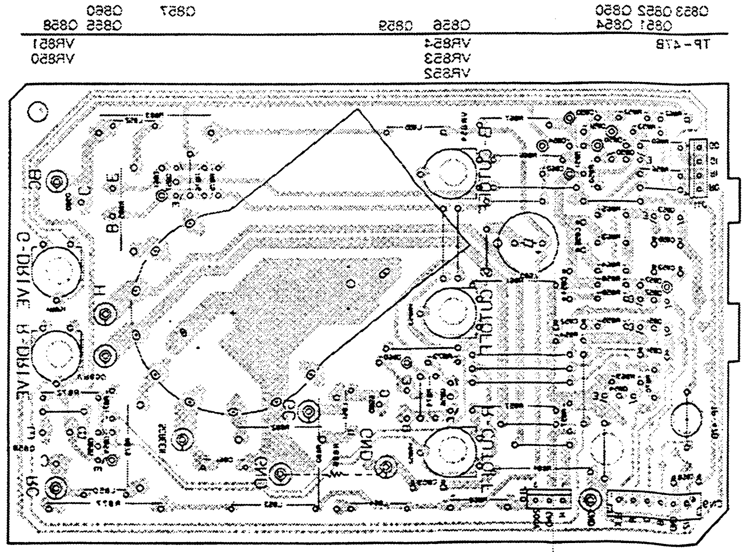


POWER SWITCH ASSEMBLY

SW PHONE ASSEMBLY



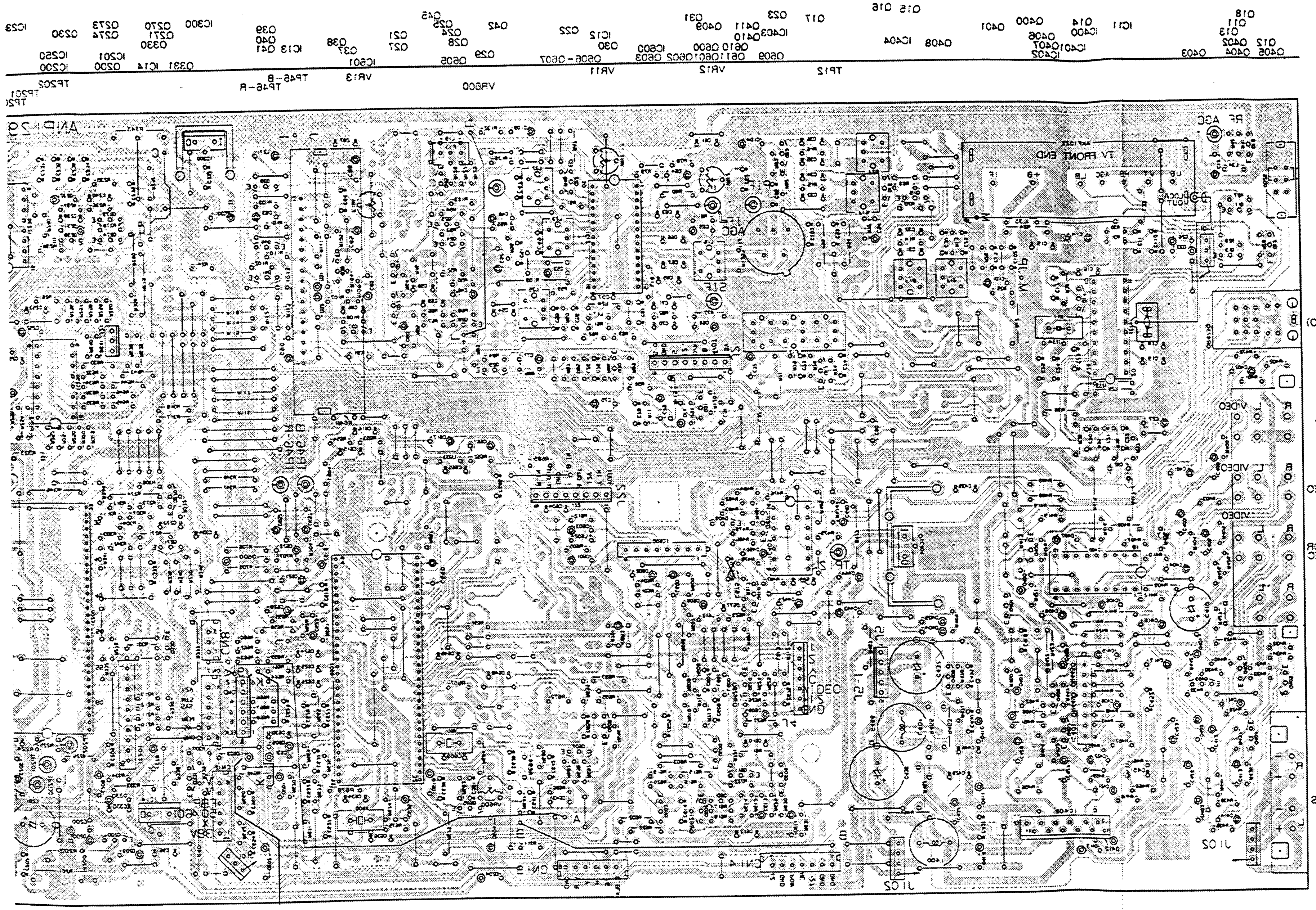
"B" and "R" indications marked on pin 2 and pin 4
J9 should be read "R" and "B" respectively.


G-DRIVE
R-DRIVE
GND

CRT ASSEMBLY (AWZ2491)

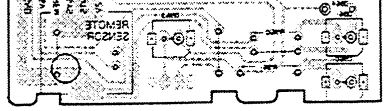
Thi

TV COMPLEX ASSEMBLY (AWZ2502)

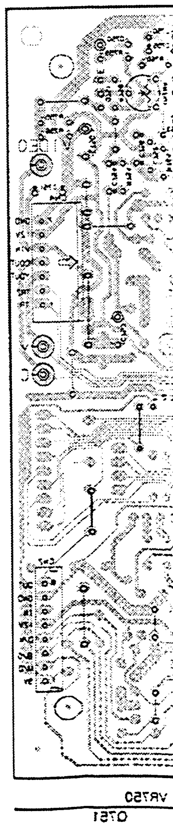

Q18
Q11
Q13
Q12
Q405
Q404
Q403
Q402
IC11
Q14
Q400
IC400
Q401
Q406
Q407
IC401
IC402
Q408
IC404
Q17
Q15
Q16
Q23
Q411
Q410
Q31
Q409
IC403
Q610
Q600
Q611
Q609
IC600
Q601
Q602
Q603
TP12
VR12
VR11
IC12
Q30
Q22
Q606
Q607
Q42
Q45
Q25
Q26
Q28
Q29
Q605
VR600
Q21
Q27
IC601
VR13
Q38
Q37
Q39
Q40
Q41
IC13
TP46-B
TP46-R
IC300
Q270
Q271
Q330
Q273
Q274
Q230
IC23
IC201
Q331
IC14
Q200
IC250
IC200
TP202
TP201
RF AGC
TV FRONT END
S (VIDEO)
VDP
INPUT
VIDEO
MONITOR /REC
OUTPUT
AUDIO
SPEAKERS
J102
J9
CN1

Note : "B" and "R" indications marked of J9 should be read "R" and "B"

LED ASSEMBLY


REMOTE SENSOR

Y/C SYSTEM ASSEMBLY (AWZ2504)



11. WIRING DIAGRAM

- If the wiring of the SD-T292 is removed, be sure to replace it as it was originally (the same "styling") during reassembly. Important points concerning the styling are illustrated in Fig. 11-1 through Fig. 11-3 and table 11-1 through table 11-3. These figures are meant only for reference, therefore, be sure to take note the styling before disassembling the unit.

Table 11-1 Precautions of Fig. 11-1.

Line No.	Styling precautions
①	J1 pass thru the upper side of the Y/C SYSTEM assembly.
②	J19 pass thru between C914 and C915.
③	Take care not to slack the AC cord between binder ⓑ and ⓒ.
④	Lead wires take care not to touch the posistors (TH901 and TH902).
⑤	Take care not to slack the J11 from binder ⓓ to purse lock ⓔ.
⑥	Take care not to slack the J19 from connector (CN19) to binder ⓔ and J18 from purse lock ⓔ to binder ⓔ.
⑦	Bind J7, J11, J21 and J6 with binder ⓕ. J7, J11 and J21 are not to slacked from hooks to binder ⓕ and also take care not to touch the primary side of power supply section.
⑧	If possible, separate J11 from the heat sink ⓐ.

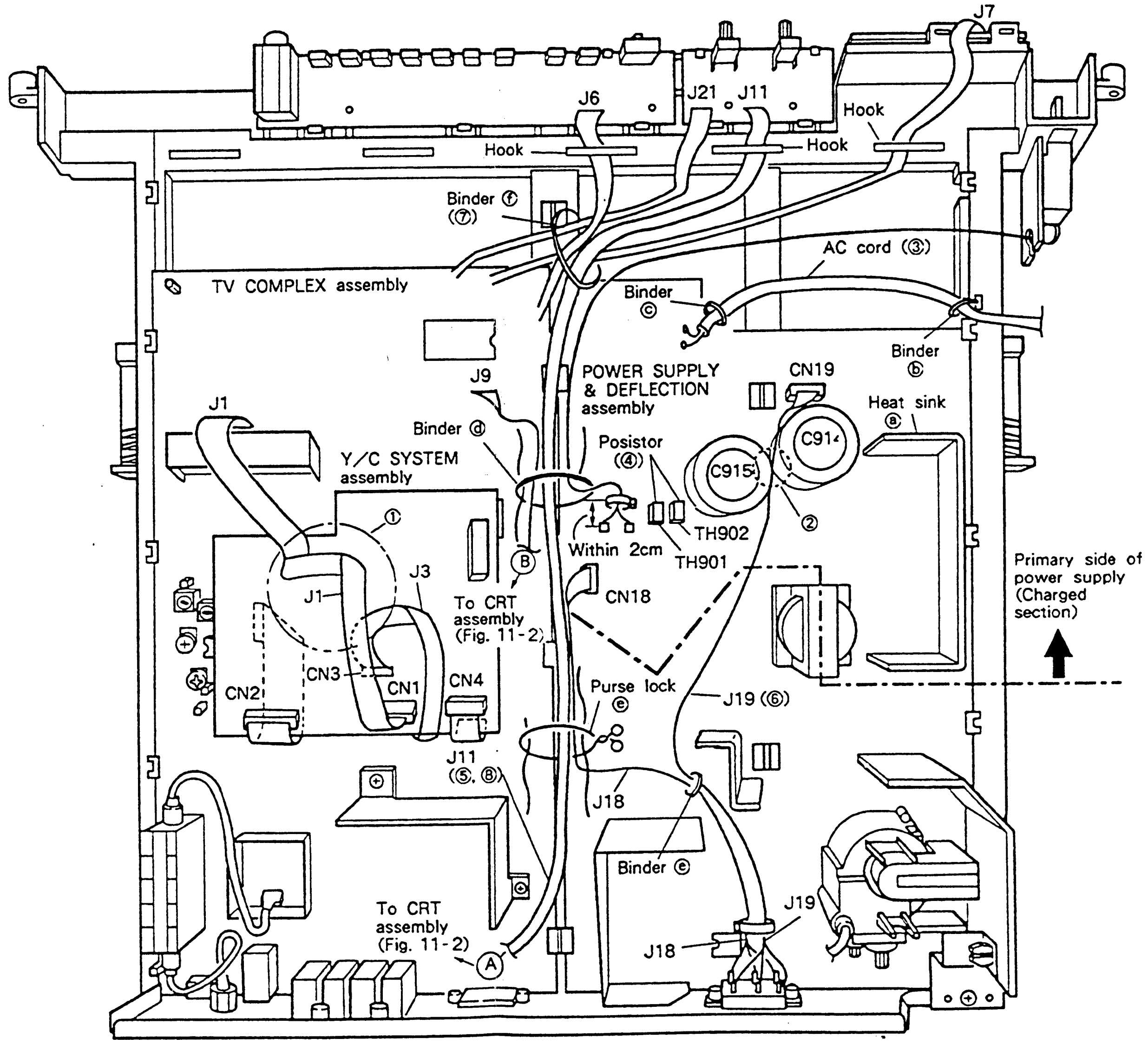

J7
J6
J21
J11
Hook
Hook
Hook
Binder ⓕ (⑦)
AC cord (③)
TV COMPLEX assembly
Binder ⓒ
Binder ⓑ
J9
POWER SUPPLY & DEFLECTION assembly
CN19
Heat sink ⓐ
J1
Binder ⓓ
Y/C SYSTEM assembly
Posistor (④)
C914
C915
①
②
TH902
TH901
Within 2cm
J1
J3
Ⓑ
To CRT assembly (Fig. 11-2)
CN18
Primary side of power supply (Charged section)
CN3
CN2
CN1
CN4
Purse lock ⓔ
J19 (⑥)
J11 (⑤, ⑧)
J18
Binder ⓔ
To CRT assembly (Fig. 11-2)
Ⓐ
J19
J18

Fig. 11-1 Top view

Table 11-2 Precautions of Fig. 11-2.

Line No.	Styling precautions
①	Fix the purse lock ⓐ so that lead wire of the degausser coil is not to touch the wire-wound resistor.
②	J10 pass thru the left side of focus and screen VRs of the FBT and take care not to touch the VRs.
③	Bind lead wires of the deflection yoke with purse lock ⓑ (deflection yoke side if possible). Also after styling, take care not to touch the heat sink.
④	Bind J10, C GND wire, screen lead wire and focus lead wire with purse lock ⓒ.
⑤	Install purse lock ⓓ to near the center point of the anode cable.
⑥	Install anode clamper ⓐ to the side of the deflection yoke.
⑦	Install anode clamper ⓑ to the center of the anode cable ring.
⑧	The slacked part of J11 should be folding.

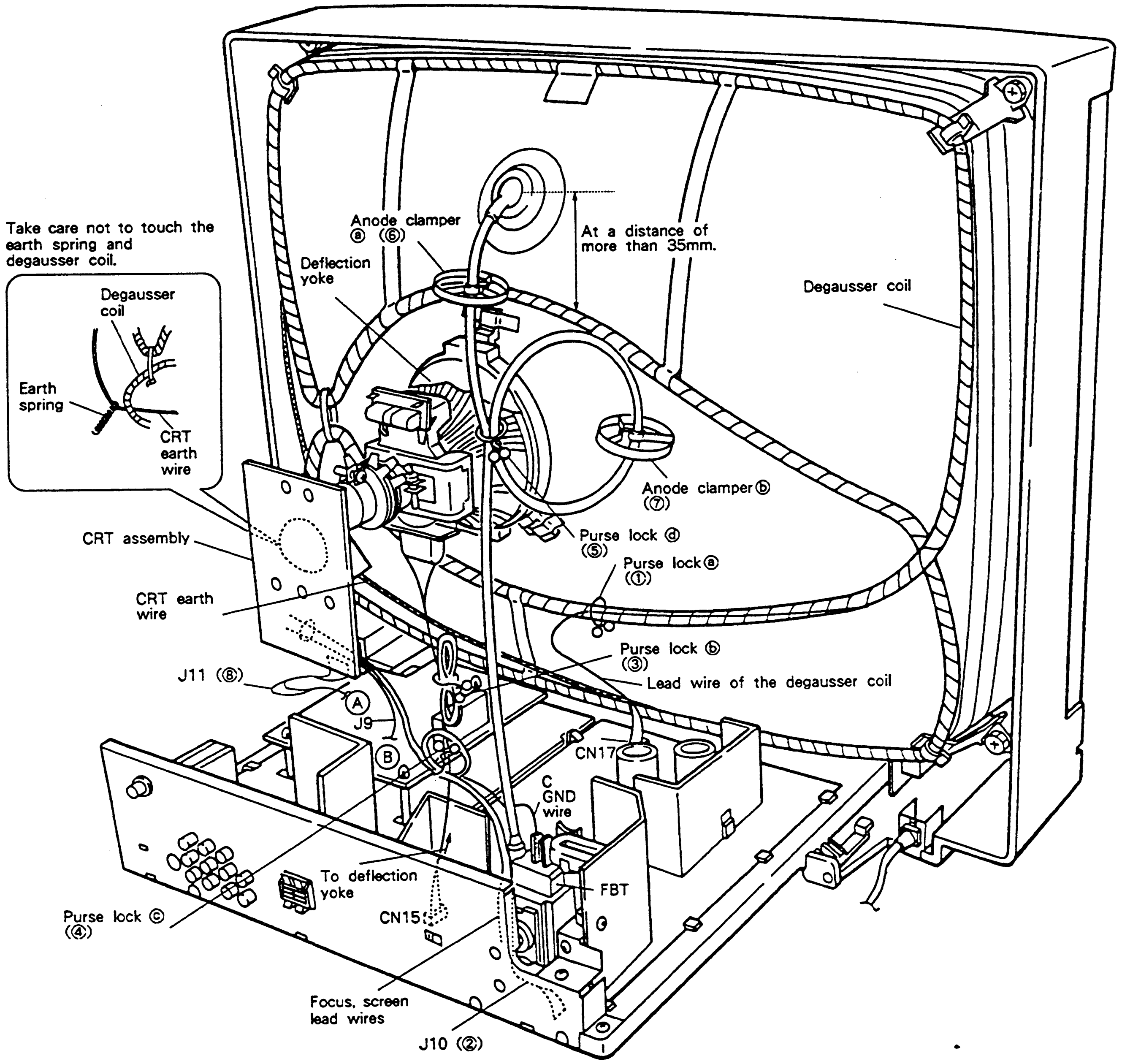
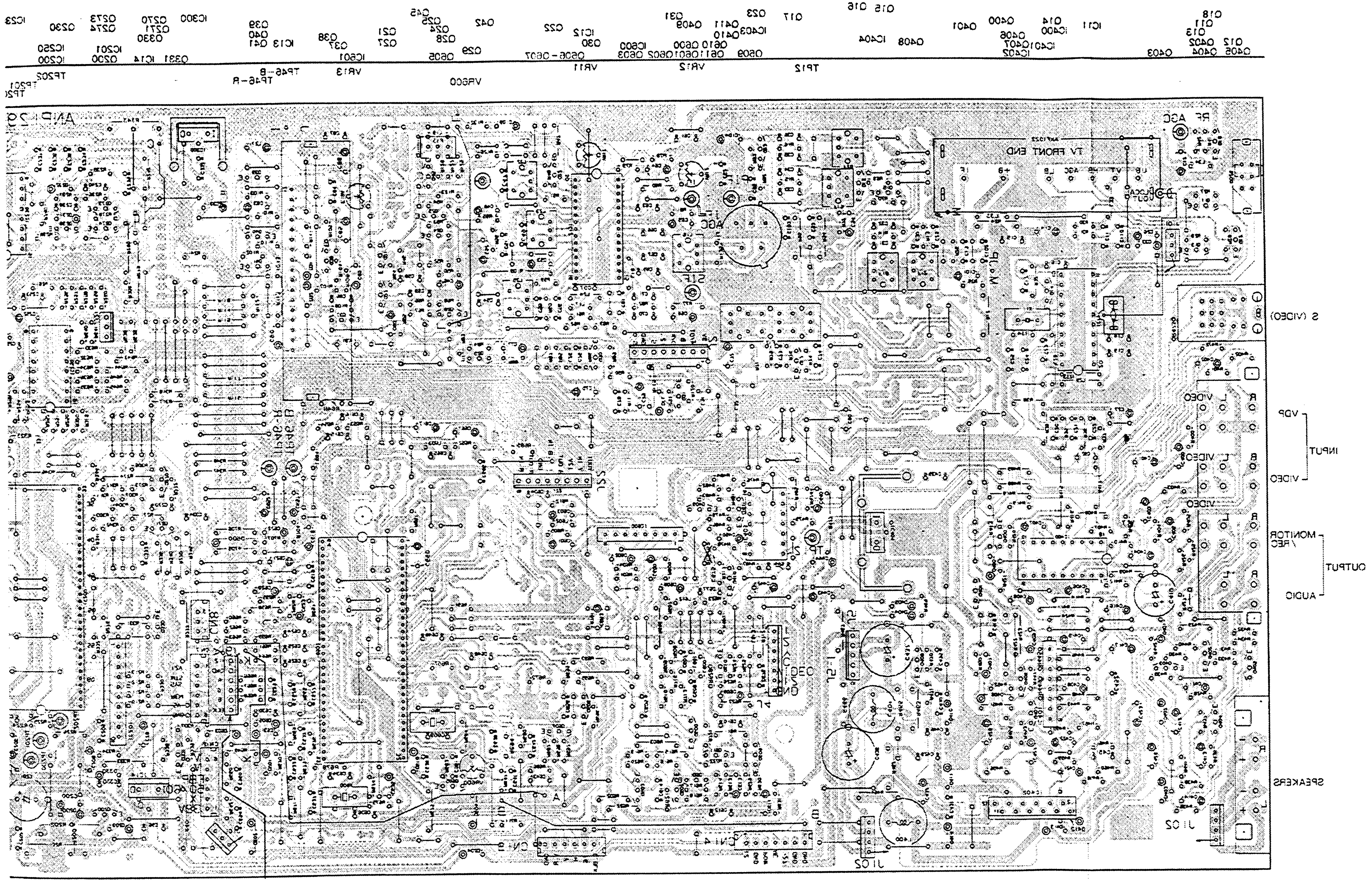

Take care not to touch the earth spring and degausser coil.
Degausser coil
Earth spring
CRT earth wire
Anode clamper ⓐ (⑥)
Deflection yoke
At a distance of more than 35mm.
Degausser coil
Anode clamper ⓑ (⑦)
CRT assembly
Purse lock ⓓ (⑤)
Purse lock ⓐ (①)
CRT earth wire
Purse lock ⓑ (③)
Lead wire of the degausser coil
J11 (⑧)
Ⓐ
J9
Ⓑ
CN17
C GND wire
To deflection yoke
FBT
CN15
Purse lock ⓒ (④)
Focus, screen lead wires
J10 (②)

Fig. 11-2 Left side view

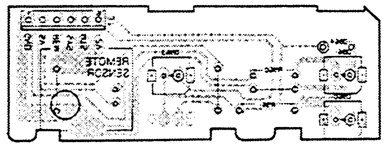
This P.C.B. connection diagram is viewed from the foil side.

TV COMPLEX ASSEMBLY (AWZ2502)


RF AGC
TV FRONT END
S (VIDEO)
VIDEO
VDP
INPUT
VIDEO
MONITOR /REC
OUTPUT
AUDIO
SPEAKERS
J102

Note : "B" and "R" indications marked of J9 should be read "R" and "B"

LED ASSEMBLY


REMOTE SENSOR

Y/C SYSTEM ASSEMBLY (AWZ2504)

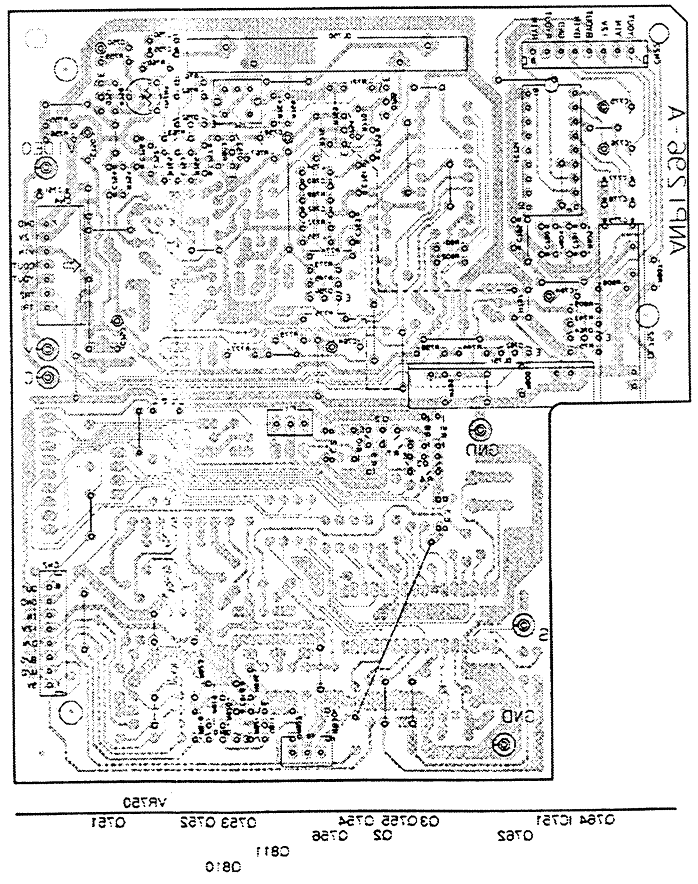

ANP1956-A
GND
GND

Table 11-3 Precaution of Fig. 11-3.

Line No.	Styling precautions
①	Bind focus wire, screen wire, J10, J9 and lead wire of C GND nearby J10 with binder ⓐ.

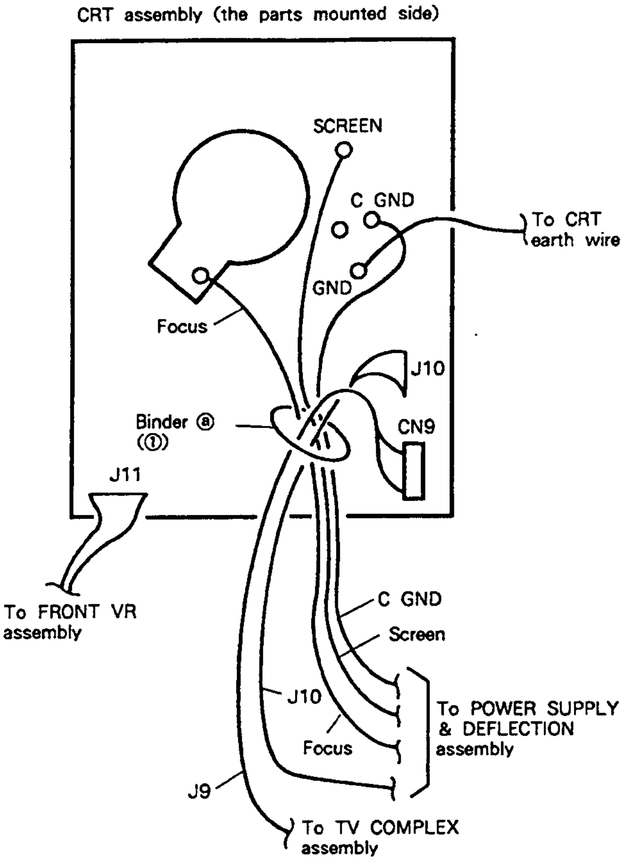

CRT assembly (the parts mounted side)
SCREEN
C GND
To CRT earth wire
GND
Focus
J10
Binder ⓐ (①)
CN9
J11
To FRONT VR assembly
C GND
Screen
J10
Focus
To POWER SUPPLY & DEFLECTION assembly
J9
To TV COMPLEX assembly

Fig. 11-3 Periphery of the CRT assembly